

Is selective laser trabeculoplasty shifting the glaucoma treatment paradigm in developing countries?

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In 2019, the Laser in Glaucoma and Ocular Hypertension (LiGHT) randomised controlled trial reported that initial treatment with selective laser trabeculoplasty (SLT) is more cost effective than initial treatment with pressure-lowering eye drops, leading to a reduced number of glaucoma surgeries and very low rates of adverse events while providing drop-free intraocular pressure (IOP) control to 78% of treated eyes after 3 years.^{1,2} As a result, the European Glaucoma Society,³ the American Academy of Ophthalmology⁴ and the UK National Institute for Health and Care Excellence⁵ now recommend the use of SLT as initial treatment for open-angle glaucoma (OAG) and ocular hypertension (OHT).

Although the LiGHT trial provided evidence for change in the treatment of for mild and moderate OAG and OHT, the evidence for the management of advanced glaucoma is not as clear. There is still a lack of robust evidence for the treatment of advanced glaucoma and/or populations at a greater risk of sight loss, currently not addressed by national and international guidelines.⁴⁻⁶ A similar lack of evidence has been identified by the Lancet Global Health Commission on global eye health, which reported an established uncertainty around managing glaucoma in African populations and has called for more research into cost-effective glaucoma interventions and management strategies applicable to the complexities of glaucoma management in African populations.⁷ Similarly, the Caribbean also faces significant barriers to healthcare access, including the availability and affordability of IOP-lowering eye drops and poor adherence to treatment.^{8,9}

The West Indies Glaucoma Laser Study (WIGLS) was a prospective multicentre

study designed to evaluate the role of SLT as a single therapy in patients of African descent residing in St Lucia and Dominica and diagnosed with primary OAG.¹⁰ WIGLS recently reported a median medication-free survival time of 85.4 months in Afro-Caribbean patients, confirming the efficacy and safety of the procedure in high-risk eyes.^{11,12} The study by Realini and colleagues aims to describe the efficacy of a similar patient cohort, with predominantly advanced OAG and at a high risk of progression.¹³ Patients recruited here were not eligible for WIGLS due to their high-risk profile not allowing medication washout. Patients were treated with SLT either to reduce medication load, due to inability to use eye drops efficiently, or to further reduce IOP that remained uncontrolled by eye drops. For those eyes given SLT to further lower IOP uncontrolled on topical medication, SLT achieved a consistent reduction over 24 months. In patients unable to efficiently administer their eye drops, SLT achieved a significant reduction in medication load, from nearly 2 medications to 1.3 medications at 2 years. These are important findings; patients of African descent have a higher glaucoma risk profile than Caucasians and face significant barriers to healthcare access,^{8,14,15} with a risk of blindness higher than other ethnicities.¹⁶⁻¹⁸ The results support the findings of a similar patient cohort from East Africa, where 0.5% timolol is the treatment of choice due to its affordability: Philippin and colleagues reported SLT's superiority, being nearly 3.4 times more likely to achieve IOP control compared with timolol.¹⁹

The findings by Realini and colleagues, however, do not come from a randomised controlled trial and the shortcomings of these prospective interventional case series need to be taken into account. This is a predominantly observational study, with no quantitative goals and the reported IOP reduction could have been affected by regression to the mean or by a differential attrition rate for eyes with uncontrolled IOP and needing surgery. However, there

is currently a lack of robust management protocols for advanced glaucoma, particularly in patients at high risk and Realini *et al* are to be applauded for reporting useful data in this area. The exclusions of such patients from randomised controlled trials not only limits our understanding of optimum management of advanced and high-risk glaucomatous eyes, but also excludes patients from potentially helpful treatment. Studies like these can, despite the lack of a traditional trial design, inform practice. While it is expected that any single treatment, such as SLT, will not suffice for most patients at high risk, understanding its efficacy in these groups and environments can help us to offer patients and health services a useful additional treatment. Patients in regions such as sub-Saharan Africa and the Caribbean face significant barriers to healthcare access, including the availability and affordability of IOP-lowering eye drops, poor adherence to treatment⁸ and non-attendance.^{9,20}

The need for an efficient glaucoma detection and management pathway in regions such as Africa and the Caribbean has sparked interest and activity in research looking into the optimisation of laser use in these regions.²¹ The African Glaucoma Laser Trial (NCT03648229) is investigating the best treatment strategy for newly diagnosed patients with OAG in Africa, offering SLT, free medical treatment and medical treatment at cost. Outside Africa and the Caribbean, the Clarifying the Optimal Application of SLT Therapy trial is investigating low energy annually repeated SLT in eyes with mild/moderate OAG or high-risk OHT,²² while the GLAURIous trial²³ and others²⁴ are investigating the efficacy of direct, non-contact SLT. Results from these studies will hopefully further improve the efficacy of SLT worldwide, but also expand the range of professionals able to deliver efficient IOP-lowering treatments in areas where access to healthcare is limited.

SLT is now adopted in the EU and USA as a firstline treatment for the management of OAG and OHT and is showing significant potential in addressing longstanding difficulties in the management of OAG in regions and populations with high prevalence and incidence of glaucoma. If evidence suggesting that SLT delays glaucoma progression compared with IOP-lowering eye drops^{1,25} are reproduced in these regions and populations, the glaucoma treatment paradigm could be shifted away from topical medical treatment, improving clinical outcomes and preserving vision in a wider number of patients.

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