

Prioritizing Selective Laser Trabeculoplasty: A Sustainable Glaucoma Treatment Option for Pakistan

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Dear Editor, Glaucoma refers to progressive optic neuropathies often linked to increased intraocular pressure, with management typically involving beta-blockers, prostaglandin analogues, among other options. Given the increasing burden of glaucoma globally, South Central Asia is projected to experience the most significant increase in cases, rising from 17.06 million in 2013 to 32.90 million by 2040.¹ It is imperative to advocate for therapies that alleviate financial burdens on patients and hospitals while improving clinical outcomes.

Selective Laser Trabeculoplasty (SLT) employs a Q-switched, frequency-doubled Nd:YAG laser (532 nm) to selectively target pigmented trabecular meshwork cells; without causing thermal damage it induces a biological response via macrophage recruitment and cytokine release, that remodels the extracellular matrix, enhancing aqueous outflow and lowering intraocular pressure (IOP). The Laser in Glaucoma and Ocular Hypertension (LiGHT) Trial highlighted the clinical effectiveness and safety of SLT compared to IOP-reducing eye drops for the treatment of open-angle glaucoma (OAG) and ocular hypertension (OHT).²

The trial demonstrated that SLT provides lasting IOP control without medications in 69.8% of cases at six years, while significantly decreasing the requirement for glaucoma and cataract surgeries compared to eye drops. Adverse effects

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were minimal, including transient IOP spikes (0.8%), rare inflammation (0.3%), and aesthetic side effects (4.5%).

The West Indies Glaucoma Laser Study (WIGLS) and the randomized controlled trial conducted in Tanzania, which compared SLT to 0.5% Timolol eye drops corroborate SLT's safety and efficacy.^{3,4} As a result, SLT has been incorporated as a first-line treatment in the revised guidelines by NICE,⁵ among others.

In terms of health economics, SLT reduces long-term dependency on medications, often prohibitively expensive due to frequent purchases at the individual and national levels through recurring imports. Many Pakistani patients struggle with medication adherence due to poor awareness and difficulties accessing pharmacies, as seen in our practice. SLT eliminates that need, making it a more viable solution. Quantifying long-term savings through its adoption would further strengthen its inclusion as a standard treatment.

In conclusion, the reduced disease progression, fewer follow-ups for monitoring compliance or repeated surgical interventions positions SLT as a sustainable and effective option for managing chronic conditions like OAG, especially in low-income countries such as Pakistan. Equitable access to laser facilities should be prioritized to realize the modality's full potential, at least in tertiary care hospitals across Pakistan. The ophthalmic community should incorporate these findings into practice to improve outcomes and significantly reduce disease-related morbidity.

Keywords: Selective Laser Trabeculoplasty, Glaucoma, Healthcare.

Table: Summary of Key Clinical Trials on SLT.

Study	Study Design and Setting	Intervention	Outcome	Trial Name, Journal
Gazzard et al. 2023 ²	Prospective, Multicenter, RCT across 6 UK hospitals	709 patients randomized (356 to SLT-first, 353 to eye drops-first)	At 6 years, SLT was safe and effective as first-line therapy, achieving sustained drop-free IOP control in 70% of cases of OHT and OAG	LiGHT Trial, American Academy of Ophthalmology
Realini et al. 2017 ³	Stepped-wedge trial in St. Lucia and Dominica	72 patients allocated to immediate, 3-month, or 6-month delayed SLT after medication washout	Meaningful IOP reductions reached in 1 year. Success rate was 78%	WIGLS, American Journal of Ophthalmology
Philippin et al. 2021 ⁴	Single-masked RCT in Northern Tanzania	201 patients randomized (101 to SLT, 100 to 0.5% timolol); outcome assessors blinded	Treatment success in 61% (SLT) vs. 31% (timolol); fewer adverse events in SLT group (8% vs. 10%)	Tanzanian SLT Glaucoma Trial, The Lancet Global Health

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