Published in final edited form as:

Am J Ophthalmol. 2017 December ; 184: 28–33. doi:10.1016/j.ajo.2017.09.022.

West Indies Glaucoma Laser Study (WIGLS): 1. 12-Month Efficacy of Selective Laser Trabeculoplasty in Afro-Caribbeans with Glaucoma

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Abstract

Purpose—To characterize the 12-month intraocular pressure (IOP)-lowering efficacy of selective laser trabeculoplasty (SLT) as sole therapy for primary open-angle glaucoma (POAG) in an Afro-Caribbean population.

Design—Stepped-wedge trial.

Methods—Subjects in St. Lucia and Dominica with established POAG were randomized to prompt washout of IOP-lowering medications followed by SLT, 3-month delay followed by washout and SLT, or 6-month delay followed by washout and SLT. Baseline IOP was obtained on two different days after washout. Bilateral 360-degree SLT was performed in one session. Post-treatment assessments took place 1 hour, 1 week, and 3, 6, 9, and 12 months post-SLT. The main outcome measure was SLT success (defined as IOP < target IOP in both eyes) at 12 months. Target IOP was a 20% or greater reduction in IOP from post-washout baseline.

Results—Overall, 72 underwent SLT treatment. Mean IOP at enrollment was 15.4 ± 3.6 mmHg in right eyes and 15.4 ± 3.6 mmHg in left eyes, which rose to 21.0 ± 3.3 mmHg and 20.9 ± 3.0 mmHg, respectively, after washout. Mean IOP at 3, 6, 9 and 12 months ranged from 12.5 mmHg to 14.5 mmHg (29.7% to 39.5%; $p < 0.0001$ in each eye at each time point). The 12-month success rate was 78%. Transient photophobia and discomfort were common.

Conclusions—SLT monotherapy safely provides significant IOP reduction in Afro-Caribbean eyes with POAG. This treatment can play a significant role in preventing glaucoma vision loss and blindness in people of African descent living in resource-limited regions.

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Introduction

Glaucoma is a leading cause of blindness in Africa and the Caribbean. African-derived populations develop glaucoma and glaucoma blindness at up to four times the rate of their European counterparts.^{1–5} Blindness often strikes working-age people in these regions, creating economic hardships for patients, their dependents, and society. The burden is getting worse not better—age-adjusted glaucoma blindness globally has increased over the past 20 years.⁶

Topical intraocular pressure (IOP)-lowering medications are the preferred primary therapy for glaucoma in developed countries. In low- and middle-income countries (LMICs), poor adherence with medical therapy compromises its utility.^{7–9} Incisional surgery for glaucoma has limited availability and very low acceptance rates (<10%) in LMICs.¹⁰ There is a clear need for a less invasive treatment approach that will be accepted earlier in these settings.

Selective laser trabeculoplasty (SLT) has several attributes favorable for application in low-resource settings. SLT provides IOP reduction similar to a prostaglandin analogue,^{11,12} has a favorable safety profile,¹³ is portable, does not require glaucoma subspecialty training to perform, requires no postoperative anti-inflammatory therapy,^{14,15} and is cost-effective when compared to medical therapy in both developed and developing countries.^{16,17}

We recently reported the results of a preliminary study of glaucoma patients in St. Lucia to characterize the efficacy and safety of SLT in patients of African descent.¹⁸ Based on promising outcomes, we are conducting an ongoing prospective multicenter study to more fully characterize the efficacy and safety of initial and repeat SLT in people of African descent residing in both St. Lucia and Dominica. In this paper we present 12-month efficacy and safety outcomes of initial SLT from the West Indies Glaucoma Laser Study (WIGLS).

Methods

This is a prospective stepped wedge study and is being conducted in accordance with the tenets of the Declaration of Helsinki. In this design, an intervention is rolled out over multiple time periods in sequential but random fashion; the crossover to the intervention is one way and is not withdrawn once implemented. The protocol has been reviewed and approved by appropriate ethics committees in the US, St. Lucia and Dominica. All study subjects provided written informed consent prior to participation. The study was registered at clinicaltrials.gov prior to the enrollment of any subjects (NCT02375009).

Qualifying subjects, drawn from existing eyecare practices in St. Lucia and Dominica, were adults age 30 years or older of self-identified African descent residing in St. Lucia or Dominica, previously diagnosed with primary open-angle glaucoma (POAG) based on ISGEO criteria,¹⁹ and receiving treatment with topical intraocular pressure (IOP)-lowering medications. After medication washout, qualifying IOP for study entry was between 18–32 mmHg, inclusive. Subjects were excluded if they had advanced POAG (defined as cup-disc ratio greater than 0.9 or automated visual field loss within the central 10 degrees in either eye), had previously undergone laser or incisional glaucoma surgery, had any intraocular inflammation within the past 3 months or ocular trauma or surgery within the past 6 months.

All participants underwent a comprehensive ophthalmological examination including spectacle-corrected visual acuity, tonometry, gonioscopy, anterior and posterior chamber inspection, automated perimetry using the SITA Standard 24-2 or 30-2 algorithms, and optical coherence tomography of the retinal nerve fiber layer (Optovue iScan in St. Lucia, Topcon Maestro in Dominica). Subjects meeting eligibility criteria were then randomized to immediate washout of topical IOP-lowering therapy, or 3-month delay before commencing washout, or 6-month delay before commencing washout. Randomization was 1:1:1 using a permuted block design with block sizes of 2 and 4 and stratified by use of prostaglandin analogue therapy at the time of randomization. The rationale for including delayed-treatment groups was to permit estimation of the effect of regression to the mean in this otherwise uncontrolled cohort study design. By observing IOP after enrollment with no change in therapy in a subset of patients, the magnitude of regression to the mean can be determined.

Subjects randomized to immediate washout discontinued use of all topical IOP-lowering medications for 6 weeks before undergoing SLT therapy. Subjects randomized to either of the two delayed SLT groups continued using their current topical IOP-lowering medications until the time of scheduled washout. Measurement of IOP at randomization and at time of washout initiation in the two delayed SLT groups permitted quantification of the effect of regression to the mean on IOP change observed after SLT therapy.

After washout, subjects underwent assessments including spectacle-corrected visual acuity, IOP, slit-lamp examination of the anterior chamber including standardized grading of aqueous cell and flare using the Standardization of Uveitis Nomenclature (SUN) Working Group's schema²⁰ as well as lens grading utilizing the Lens Opacification Grading System (LOCS) III schema. Baseline IOP was determined in two sessions 1–3 days apart. IOP was measured by a single examiner using the same Perkins tonometer at the same time of day (± 2 hours) for each subject following a modified OHTS protocol as follows: the Perkins tonometer is set to 10 mmHg; the eye is applanated and the examiner adjusts the dial without looking at it to achieve applanation; the Perkins tonometer is removed from the eye, the IOP is read from the dial and recorded, and the dial is set back to 10 mmHg; a second reading from the same eye is obtained, again without looking at the dial, which is then read and recorded. A third reading was taken only if the first two differ by 4 mmHg or more. These two (or three) values were averaged. The procedure was repeated on the fellow eye. To establish pre-laser baseline IOP, this entire session was repeated within 1–3 days and the average of both sessions determined final eligibility (IOP between 18–32 mmHg in both eyes after washout) and represented baseline IOP. All subsequent IOP assessments throughout the study were obtained similarly in a single session. Target IOP was calculated as a 20% reduction from baseline rounded to the nearest mmHg or 22 mmHg, whichever was lower. Study personnel responsible for IOP measurement were masked to target IOP and to all prior IOP readings.

SLT was performed immediately following post-washout assessment. The Lumenis Selecta II portable slit-lamp mounted system was used in all cases. Both eyes were treated in a single session following application of topical anesthesia and one drop of brimonidine 0.2% solution to each eye. Approximately 100 treatment spots were delivered to the full 360 degrees of trabecular meshwork in each eye. Power was adjusted throughout the procedure,

based on sectorial pigment patterns, to ensure the generation of tiny champagne bubbles on every second to third spot. One hour post-treatment, IOP, adverse events, and pain during the procedure (rated by subjects on a 1–10 scale) were assessed. Subsequent post-treatment assessments occurred at 1 week, 6 weeks, 3 months, and every 3 months thereafter. These assessments included visual acuity, IOP, slit lamp examination including assessment of cell/flare and LOCS3 lens grading, and solicitation of adverse events. Beginning with the Month 3 visit, achievement of target IOP was assessed. If mean IOP in either eye exceeded target IOP at any visit beginning with Month 3, a second IOP assessment was undertaken on a separate day 1–3 days later. Failure was declared if IOP exceeded target IOP at both assessments. Upon failure, patients were given the option of repeat SLT or restarting topical medical therapy. If elected, repeat SLT was performed immediately and in identical fashion to initial SLT. Target IOP for assessment of repeat SLT efficacy remained the same as for initial SLT (ie, target IOP was not recalculated based on IOP at initial SLT failure).

Statistical Analysis

The statistical objective of this report was to characterize the IOP reduction provided by initial SLT in an Afro-Caribbean population. The primary outcome measure for this analysis was IOP reduction from baseline. We hypothesized that Kaplan-Meier survival analysis would demonstrate a minimum 75% survival of initial SLT (both eyes at or below target IOP with no further interventions) at 12 months.

Sample size for WIGLS was based on analyses planned to assess the efficacy of repeat SLT in this population upon failure of initial SLT. To achieve appropriate statistical power for analysis of repeat SLT efficacy, 20 subjects are required from WIGLS into a repeat SLT cohort. Based on an estimated 35% 2-year failure rate of initial SLT observed in our preliminary study, 58 subjects would need to undergo initial SLT in WIGLS in order for 20 to fail by the end of Year 2 and undergo repeat SLT. To account for attrition, we planned to enroll 70 subjects in WIGLS.

Summary statistics of the demographic and clinical characteristics are presented for the analyzable sample of 72 patients. Descriptive statistics are presented as means and standard deviations for IOP, IOP reduction from baseline and percent IOP reduction at each time point for right and left eyes. A one-sample t-test was used to compare the percent IOP mean reduction from baseline to a given null hypothesis value $h_0=0$. Statistical significance was defined as a one-sided p value less than 0.05. Analyses were conducted using SAS version 9.2 (SAS Institute Inc., Cary, NC).

Results

Overall, 78 subjects were enrolled in this study. At randomization, 24 subjects each were assigned to immediate washout/SLT, to 3-month delay before washout/SLT, and to 6-month delay before washout/SLT. Five subjects withdrew consent before undergoing SLT, and one subject had washout IOP below the protocol-specified range. A total of 72 subjects underwent initial SLT and are included in this analysis. Demographic data and glaucoma-specific and SLT parameters of these 72 subjects are given in Table 1.

The mean IOP at enrollment (before washout) was 15.4 ± 3.6 mmHg in both right and left eyes. After washout, the mean IOP (pre-SLT baseline) rose to 21.0 ± 3.3 mmHg and 20.9 ± 3.0 mmHg, respectively. During the laser treatment, a mean of 86.0 ± 21.1 mJ of energy was delivered via a mean of 102.3 ± 2.5 treatment spots in right eyes; in left eyes, the corresponding values were 87.7 ± 20.6 mJ and 101.7 ± 1.7 treatment spots. Data for IOP through 12 months of post-SLT follow-up are given in Table 2 and Figure 1. Beginning with Week 6, mean IOP reductions ranged from 6.2–7.7 mmHg in right eyes and from 6.5–8.4 mmHg in left eyes ($P < .0001$ for both eyes at all time points), and mean percent IOP reductions ranged from 29.7–36.6% in right eyes and from 31.0–40.3% in left eyes ($p < .0001$ for both eyes at all time points), during the first year after treatment. In the delayed treatment groups, mean IOP at enrollment (15.1 ± 3.7 mmHg in right eyes and 14.8 ± 3.7 mmHg in left eyes) and at washout (15.5 ± 3.4 mmHg in right eyes and 15.7 ± 3.6 mmHg in left eyes) were statistically similar ($p = 0.22$), demonstrating no significant effect of regression to the mean on the observed IOP reductions after SLT.

Kaplan-Meier survival analysis demonstrated a survival rate of 78.7% at 12 months following initial SLT; that is, 78.7% of subjects achieved and maintained target IOP in both eyes for a minimum of 12 months post-SLT. 15 subjects (21 eyes) failed initial SLT within 12 months; of these, 16 eyes underwent repeat SLT, 4 resumed medical IOP-lowering therapy, and 1 was observed with no further IOP-lowering interventions. IOP in eyes reaching the failure endpoint was a mean of 3.2 ± 2.2 mmHg above target, with 14 (66.7%) of failing eyes doing so at an IOP < 3 mmHg above target. An additional 8 eyes of 6 subjects were censored during the first 12 months for the following reasons: 3 eyes were retreated for borderline (but below target) IOP at the time that fellow eyes were retreated for failure; 2 eyes of 1 subject developed iritis requiring steroid therapy; one eye underwent elective cataract surgery; and one subject moved off-island.

Initial SLT treatment was well tolerated by all subjects, with mean subjective pain score of 2.9 ± 2.6 (79% of subjects reported pain score of 3 or less). Adverse events are given in Table 3. Twenty-seven subjects (37.5%) reported photophobia following the procedure. This was generally mild or moderate in severity, with onset within 24 hours of treatment, and resolved spontaneously within 3–4 days. Post-treatment eye pain was reported by 22 patients (30.6%). As with photophobia, this appeared within 1 day of treatment, was generally mild or moderate in severity and resolved spontaneously within a few days. Eleven subjects (15.3%) reported transient headache post-treatment. Three eyes of two patients manifested an acute post-SLT IOP spike > 5 mmHg (none exceeding 10 mmHg), all of which responded to topical IOP-lowering therapy and were resolved by 1 week. No eyes manifested a sustained IOP elevation following initial SLT. One eye developed brief central corneal edema associated with a 2-line reduction in visual acuity, noted at 1 week, that spontaneously resolved with return of vision to pre-treatment baseline by 6 weeks post-treatment. One subject developed bilateral symptomatic anterior iritis one day postoperatively and reported a previously undisclosed history of recurrent iritis; the iritis resolved with topical steroid therapy. No adverse events deemed related to laser therapy were observed more than 1 week post-treatment.

Discussion

This study demonstrates that selective laser trabeculoplasty effectively and safely lowers intraocular pressure in Afro-Caribbean subjects with primary open-angle glaucoma. Mean IOP reductions at 1 year post-treatment are approximately 30%, with mean IOP of 14.5 mmHg achieved. Nearly 80% of treated subjects maintain a minimum IOP reduction of 20% through the first 12 months after therapy. Side effects were generally not vision-threatening, mild or moderate in severity, and self-limited.

These results are consistent with other reports of SLT outcomes in people of African descent. Our group published the first such report in a cohort of Afro-Caribbean glaucoma patients in St. Lucia.¹⁸ In that study, mean IOP reductions of 34–39% were observed during the first year, with 78% of subjects requiring no further interventions during that time. More recently, Goosen and colleagues reported the response to SLT in African subjects with glaucoma in South Africa.²¹ In their study, mean IOP reductions of 42% were seen, with 90% of treated subjects achieving and maintaining a minimum 20% IOP reduction from baseline through 12 months of follow-up. The magnitude of IOP reduction seen in these studies of patients of African descent exceeds the reported treatment effect in largely Caucasian study samples.^{11,12} While the greater responses seen in studies of African patients might be related to differences in investigators' laser treatment techniques, Goosen and colleagues included Indian and Caucasian cohorts in their study and found significantly less effect in these two groups (approximately 28% IOP reduction) compared to black Africans (42%). This suggests a true differential response that is ethnicity-dependent. The SLT laser platform is based on selective photolysis, in which pigmented cells in the trabecular meshwork preferentially absorb the applied laser energy.²² Given the differential pigmentation patterns in Black versus non-Black eyes, it is biologically plausible that—and these data taken together support the conclusion that—SLT is more effective in Black than non-Black eyes.

Glaucoma is the most commonly identified cause of irreversible blindness throughout the world. The prevalence of open-angle glaucoma varies with ethnicity, being more common in people of African descent compared to those of European descent. In a recent global meta-analysis, Tham and colleagues estimated the prevalence of glaucoma in people of African descent aged 40–80 to be 6.1%, a 2.8-fold higher risk than in people of European ancestry.²³ These investigators projected that the number of people with open-angle glaucoma in Africa will nearly double between 2020 and 2040, from 8.7 million to 16.3 million cases. Many of these cases will progress to vision loss or blindness owing to limitations of health care resources in this region. According to the World Bank, all 10 of the world's poorest countries are in Africa.²⁴

Our current and previous data,¹⁸ coupled with the data from Goosen and colleagues,²¹ suggest that a laser-first glaucoma care process could reduce glaucoma-related blindness in resource-limited regions populated by people of African descent (ie, Africa and the Caribbean). In all three of these studies, SLT lowered IOP by approximately 30–40%, an effect size that would reasonably be expected to favorably alter the natural history of glaucoma.^{25,26} Likewise, the response rate (80–90% at 12 months across these three studies)

suggests that most treated patients would derive meaningful benefit. Consistent among these three studies—and the broader literature on SLT in all populations²⁷--was that SLT was well tolerated and not associated with vision-threatening complications. In addition to its efficacy and safety profiles, SLT has other attributes that favor its position as primary therapy for open-angle glaucoma. The device is portable, the procedure does not require glaucoma subspecialty training to perform, treated eyes require no postoperative anti-inflammatory therapy,^{14,15} and the treatment is cost-effective when compared to medical therapy in both developed and developing countries.^{16,17}

Our study is strengthened by several design features. The study followed a pre-specified protocol, was conducted prospectively, and key outcome data (IOP) were collected by study personnel masked to treatment targets. We have evaluated efficacy of SLT when employed as monotherapy and have established baseline IOP over several days to account for IOP variability. Success/failure criteria were pre-specified and the declaration of failure required confirmation at a second visit on a different day, also in recognition of the known intra- and inter-day variations of IOP. Subjects failing initial SLT were offered repeat SLT and acceptance of repeat SLT was 86%, so in time we will also be able to report the efficacy and safety of repeat SLT in this cohort. One limitation of our study was the lack of a control group. We considered a clinical trial comparing SLT to medical therapy. This was rejected on the basis that, in resource-limited regions, the effectiveness of medical therapy was likely more dependent upon acquisition and administration of medications rather than inherent pharmacodynamic efficacy of the drugs themselves. To account for this expectation, we also considered a control group in which subjects would receive not medications but a prescription for medications. This would very likely have left many or most of the control subjects untreated, which we (and likely ethics review committees) found unacceptable. Ultimately, we concluded that there was no appropriate control group—many patients in low- and middle-income countries cannot afford medical or surgical therapy and there are few trained specialists to offer surgery in these regions. The goal of our study was to characterize the efficacy and safety of SLT in a cohort of African-derived glaucoma patients, and not to compare SLT's efficacy and safety to unrealistic alternative therapies. One attribute of a controlled study that we wished to derive—characterization of regression to the mean—was addressed by randomizing subjects to immediate or delayed SLT.

In conclusion, we report that SLT utilized as monotherapy in Afro-Caribbean people with primary open-angle glaucoma effectively and safely lowers IOP by a magnitude known to slow or halt the progression of glaucoma. Long-term follow-up of this study cohort is ongoing. Our data, combined with similar existing and emerging data sets in African eyes, strongly support the application of SLT as primary therapy for open-angle glaucoma in this population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

- A. Funding/Support: This study was funded by the National Eye Institute R01 EY023620 (principal investigator: TR).
- B. Financial Disclosure: Dr. Realini is a consultant to Alcon, Aerie, Bausch & Lomb, Inotek, Novartis, New World Medical, IRIS, and Smith & Nephew. Drs. Shillingford-Ricketts, Burt and Balasubramani have no financial disclosures to report.
- C. Other Acknowledgements: none.

References

1. Wilson MR, Kosoko O, Cowan CL Jr, et al. Progression of visual field loss in untreated glaucoma patients and glaucoma suspects in St. Lucia, West Indies. *Am J Ophthalmol.* 2002; 134(3):399–405. [PubMed: 12208252]
2. Mason RP, Kosoko O, Wilson MR, et al. National survey of the prevalence and risk factors of glaucoma in St. Lucia, West Indies. Part I. Prevalence findings. *Ophthalmology.* 1989; 96(9):1363–8. [PubMed: 2789357]
3. Leske MC, Wu SY, Honkanen R, et al. Nine-year incidence of open-angle glaucoma in the Barbados Eye Studies. *Ophthalmology.* 2007; 114(6):1058–64. [PubMed: 17397925]
4. Leske MC, Connell AM, Schachat AP, Hyman L. The Barbados Eye Study. Prevalence of open angle glaucoma. *Arch Ophthalmol.* 1994; 112(6):821–9. [PubMed: 8002842]
5. Leske MC, Wu SY, Hyman L, Nemesure B, Hennis A, Schachat AP. Four-year incidence of visual impairment: Barbados Incidence Study of Eye Diseases. *Ophthalmology.* 2004; 111(1):118–24. [PubMed: 14711723]
6. Bourne RR, Taylor HR, Flaxman SR, et al. Number of People Blind or Visually Impaired by Glaucoma Worldwide and in World Regions 1990 – 2010: A Meta-Analysis. *PLoS ONE.* 2016; 11(10):e0162229. [PubMed: 27764086]
7. Congdon NG, Krishnadas R, Friedman DS, et al. A study of initial therapy for glaucoma in southern India: India Glaucoma Outcomes and Treatment (INGOT) Study. *Ophthalmic Epidemiol.* 2012; 19(3):149–58. [PubMed: 22568428]
8. Gurwitz JH, Glynn RJ, Monane M, et al. Treatment for glaucoma: adherence by the elderly. *Am J Public Health.* 1993; 83(5):711–6. [PubMed: 8484454]
9. Sleath BL, Krishnadas R, Cho M, et al. Patient-reported barriers to glaucoma medication access, use, and adherence in southern India. *Indian J Ophthalmol.* 2009; 57(1):63–8. [PubMed: 19075417]
10. Abdull MM, Gilbert CC, Evans J. Primary open angle glaucoma in northern Nigeria: stage at presentation and acceptance of treatment. *BMC Ophthalmol.* 2015; 15:111. [PubMed: 26296993]
11. Katz LJ, Steinmann WC, Kabir A, Molineaux J, Wizov SS, Marcellino G. Selective laser trabeculoplasty versus medical therapy as initial treatment of glaucoma: a prospective, randomized trial. *J Glaucoma.* 2012; 21(7):460–8. [PubMed: 21543992]
12. McIlraith I, Strasfeld M, Colev G, Hutnik CM. Selective laser trabeculoplasty as initial and adjunctive treatment for open-angle glaucoma. *J Glaucoma.* 2006; 15(2):124–30. [PubMed: 16633226]
13. Realini T. Selective laser trabeculoplasty: a review. *J Glaucoma.* 2008; 17(6):497–502. [PubMed: 18794688]
14. Realini T, Charlton J, Hettlinger M. The impact of anti-inflammatory therapy on intraocular pressure reduction following selective laser trabeculoplasty. *Ophthalmic Surg Lasers Imaging.* 2010; 41(1):100–3. [PubMed: 20128578]
15. De Keyser M, De Belder M, De Groot V. Randomized Prospective Study of the Use of Anti-Inflammatory Drops After Selective Laser Trabeculoplasty. *J Glaucoma.* 2016
16. Stein JD, Kim DD, Peck WW, Giannetti SM, Hutton DW. Cost-effectiveness of medications compared with laser trabeculoplasty in patients with newly diagnosed open-angle glaucoma. *Arch Ophthalmol.* 2012; 130(4):497–505. [PubMed: 22332202]

17. Wittenborn JS, Rein DB. Cost-effectiveness of glaucoma interventions in Barbados and Ghana. *Optom Vis Sci.* 2011; 88(1):155–63. [PubMed: 21076360]
18. Realini T. Selective laser trabeculoplasty for the management of open-angle glaucoma in St. Lucia *JAMA Ophthalmol.* 2013; 131(3):321–7. [PubMed: 23348420]
19. Foster PJ, Buhrmann R, Quigley HA, Johnson GJ. The definition and classification of glaucoma in prevalence surveys. *Br J Ophthalmol.* 2002; 86(2):238–42. [PubMed: 11815354]
20. Jabs DA, Nussenblatt RB, Rosenbaum JT. Standardization of uveitis nomenclature for reporting clinical data. Results of the First International Workshop. *Am J Ophthalmol.* 2005; 140(3):509–16. [PubMed: 16196117]
21. Goosen E, Coleman K, Visser L, Sponsel WE. Racial Differences in Selective Laser Trabeculoplasty Efficacy. *J Curr Glaucoma Pract.* 2017; 11(1):22–7. [PubMed: 28138214]
22. Latina MA, Park C. Selective targeting of trabecular meshwork cells: in vitro studies of pulsed and CW laser interactions. *Exp Eye Res.* 1995; 60(4):359–71. [PubMed: 7789416]
23. Tham YC, Li X, Wong TY, Quigley HA, Aung T, Cheng CY. Global prevalence of glaucoma and projections of glaucoma burden through 2040: a systematic review and meta-analysis. *Ophthalmology.* 2014; 121(11):2081–90. [PubMed: 24974815]
24. The World Bank. [Accessed June 6, 2017] at http://data.worldbank.org/indicator/NY.GDP.PCAP.CD?year_high_desc=false
25. Heijl A, Leske MC, Bengtsson B, Hyman L, Bengtsson B, Hussein M. Reduction of intraocular pressure and glaucoma progression: results from the Early Manifest Glaucoma Trial. *Arch Ophthalmol.* 2002; 120(10):1268–79. [PubMed: 12365904]
26. Lichter PR, Musch DC, Gillespie BW, et al. Interim clinical outcomes in the Collaborative Initial Glaucoma Treatment Study comparing initial treatment randomized to medications or surgery. *Ophthalmology.* 2001; 108(11):1943–53. [PubMed: 11713061]
27. Song J. Complications of selective laser trabeculoplasty: a review. *Clinical Ophthalmology.* 2016; 10:137–43. [PubMed: 26834456]

Figure 1. Intraocular pressure at baseline and through 12 months of follow-up after selective laser trabeculoplasty in the West Indies Glaucoma Laser Study.

Table 1

Demographic and glaucoma status data of subjects participating in the West Indies Glaucoma Laser Study.

Characteristic	Value	
Gender, n (%)		
Male	29 (40.3%)	
Female	43 (59.7%)	
Age, yr	61.0 (11.4)	
Ethnicity, n (%)	72 (100) African descent	
Number of glaucoma medications, n (%)		
0	5 (6.9)	
1	45 (62.5)	
2	18 (25)	
3	4 (5.6)	
Glaucoma medication classes, n (%)		
Beta-blockers	42 (58.3)	
Prostaglandins	35 (48.6)	
Carbonic anhydrase inhibitors	8 (6.9)	
Adrenergic agonists	8 (6.9)	
	Right eye	Left eye
Central corneal thickness, mean (SD)	537.4 (35.6)	543.3 (37.9)
Vertical cup-disc ratio, mean (SD)	0.7 (0.1)	0.7 (0.1)
Visual field mean deviation, mean (SD)	-4.6 (5.2)	-3.9 (3.8)
Laser parameters, mean (SD)		
Total energy (mJ)	86.0 (21.2)	87.7 (20.6)
Number of treatment spots	102.3 (2.5)	101.7 (1.7)

Table 2

Intraocular pressure at each time point before and after selective laser trabeculoplasty in the West Indies Glaucoma Laser Study.

Time	IOP (mmHg), mean (SD)		IOP reduction (mmHg), mean (SD)		Percent IOP reduction (%), mean (SD)		p-value for change from baseline	
	Right	Left	Right	Left	Right	Left	Right	Left
Pre- washout	15.42 (3.55)	15.36 (3.64)	--	--	--	--	--	--
Baseline	20.99 (3.26)	20.9 (3.0)	--	--	--	--	--	--
1 hour	18.3 (4.9)	18.4 (4.9)	2.65 (3.8)	2.45 (3.9)	12.8 (19.1)	11.8 (19.0)	<.0001	<.0001
1 week	10.6 (3.8)	10.2 (3.7)	10.3 (4.1)	10.6 (3.8)	49.1 (17.9)	51.0 (16.8)	<.0001	<.0001
6 weeks	13.4 (3.7)	12.5 (4.0)	7.6 (3.9)	8.4 (3.9)	35.8 (17.4)	40.3 (18.1)	<.0001	<.0001
3 months	13.1 (3.4)	12.5 (3.2)	7.7 (3.7)	8.3 (3.6)	36.6 (15.9)	39.5 (15.3)	<.0001	<.0001
6 months	13.3 (3.6)	13.4 (4.1)	7.6 (3.5)	7.5 (4)	36.3 (16.0)	35.8 (18.2)	<.0001	<.0001
9 months	13.4 (4.2)	13.3 (3.0)	7.5 (4)	7.6 (2.7)	35.9 (17.7)	36.4 (11.9)	<.0001	<.0001
12 months	14.5 (4.0)	14.2 (3.3)	6.2 (4)	6.5 (3.4)	29.7 (17.8)	31.0 (15.3)	<.0001	<.0001

Table 3

Incidence of adverse events observed following selective laser trabeculoplasty in the West Indies Glaucoma Laser Study.

Adverse event	Prevalence, n (%)
Photophobia	27 (37.5)
Eye pain	22 (30.6)
Headache	11 (15.3)
Intraocular pressure spike >5 mmHg	2 (2.8)
Conjunctival hyperemia	2 (2.8)
Corneal abrasion	1 (1.4)
Symptomatic anterior iritis	1 (1.4)
Corneal edema	1 (1.4)
Blurred vision	1 (1.4)