

The Role of Laser Surgery in Africa

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Disclosures

Consultant:

- Aerie
- IStarMed
- New World Medical
- ViSci

Glaucoma in Africa

- Burden of disease
- Barriers to care
- Solutions
 - Many barriers
 - Many countries
 - Many cultures
 - Many health care systems

Features of an Ideal First-Line Therapy

- Efficacy
- Safety
- Adherence
- Cost
- Availability

REVIEW ARTICLE

The Rationale for Selective Laser Trabeculoplasty in Africa

Tony Realini, MD, MPH, Olusola Olawoye, MD,† Nkiru Kizor-Akaraiwe, MD,‡
Selina Manji, MSc, PharmD,§ and Arthur Sit, SM, MD¶*

(Asia Pac J Ophthalmol (Phila) 2018;7:387–393)

SLT in Africa: Efficacy

Selective Laser Trabeculoplasty for the Management of Open-Angle Glaucoma in St. Lucia

Tony Realini, MD, MPH

Objective: To evaluate the efficacy of selective laser trabeculoplasty (SLT) for the treatment of primary open-angle glaucoma in an African-derived population in the developing world.

Methods: Sixty-one subjects from St. Lucia with medically treated primary open-angle glaucoma underwent a 30-day washout, followed by bilateral 360° SLT. Intraocular pressure (IOP) was measured 1 hour; 1 week; and 1, 3, 6, 9, and 12 months after SLT.

Results: Mean (SD) IOP with medical therapy was 17.3 (5.0) mm Hg and 17.5 (4.0) mm Hg in the right and left eyes, respectively, and increased to 21.4 (3.6) mm Hg and 21.1 (3.5) mm Hg, respectively, after washout. Both eyes demonstrated a prompt and sustained IOP response to SLT therapy. Intraocular pressure dropped significantly by the first week and remained in the range of 13 to 14 mm Hg without medical therapy through 12 months in patients deemed successful. The mean IOP reductions from baseline ranged from 7.3 to 8.3 mm Hg (34.1%-

38.8%) in right eyes and from 7.6 to 8.2 mm Hg (36.0%-38.9%) in left eyes through 12 months. The 12-month Kaplan-Meier survival rate ($\geq 10\%$ IOP reduction from postwashout baseline) was 77.7%, and 93% of successful subjects experienced IOP levels less than with-medication values. Most subjects reported moderate photophobia for 2 to 3 days after SLT; only 1 received anti-inflammatory therapy. Five eyes of 3 subjects had IOP spikes between 5 and 10 mm Hg that resolved without treatment.

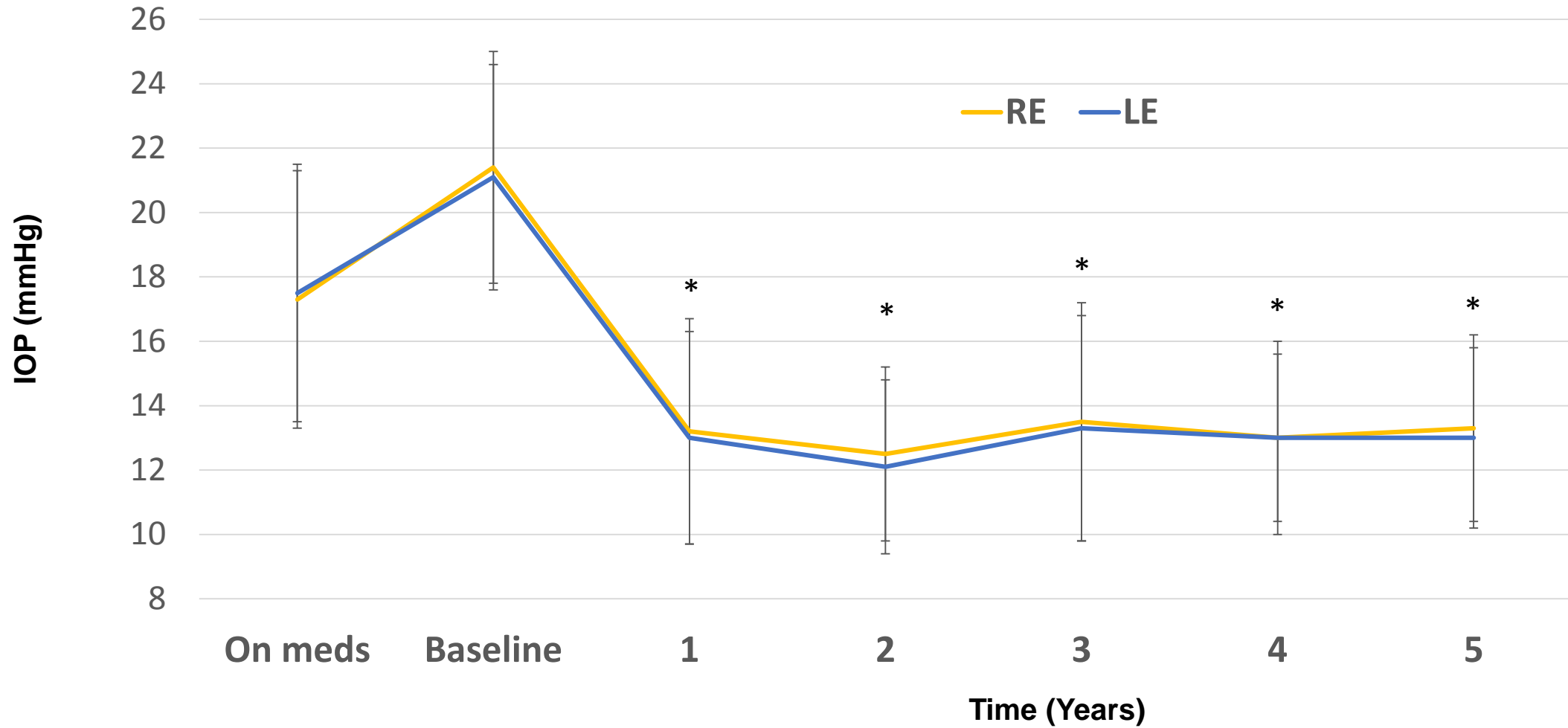
Conclusions: The magnitude and duration of IOP reduction are clinically relevant in individuals from St. Lucia of African descent. If repeatable, SLT could be a powerful tool for reducing glaucoma-related blindness in this population.

JAMA Ophthalmol. 2013;131(3):321-327.

Published online January 24, 2013.

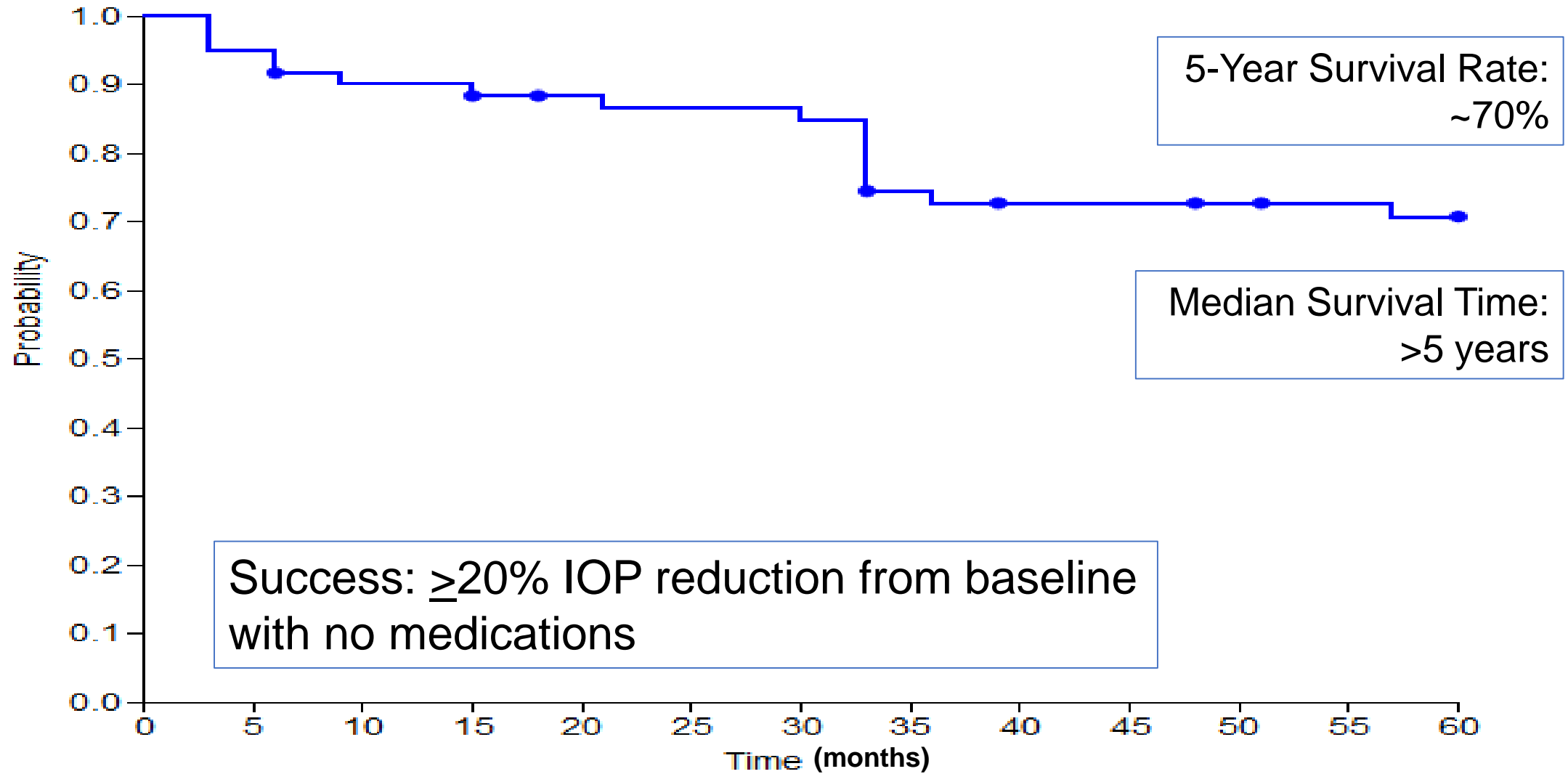
doi:10.1001/jamaophthalmol.2013.1706

Mean IOP Over Time

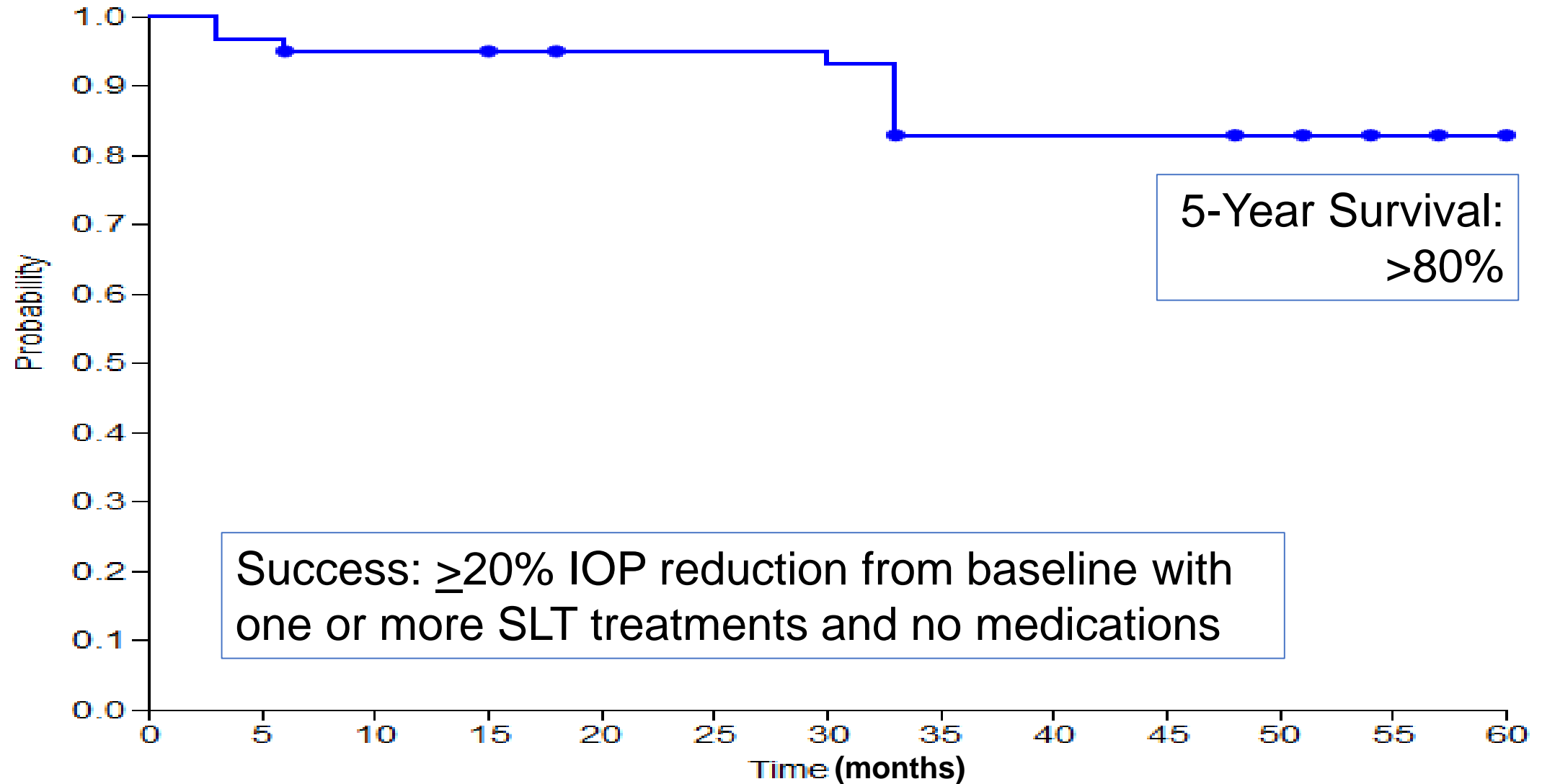


*P<0.001 at all time points compared to baseline AND on meds

First SLT: Survival Analysis



Overall 5-Year SLT Survival



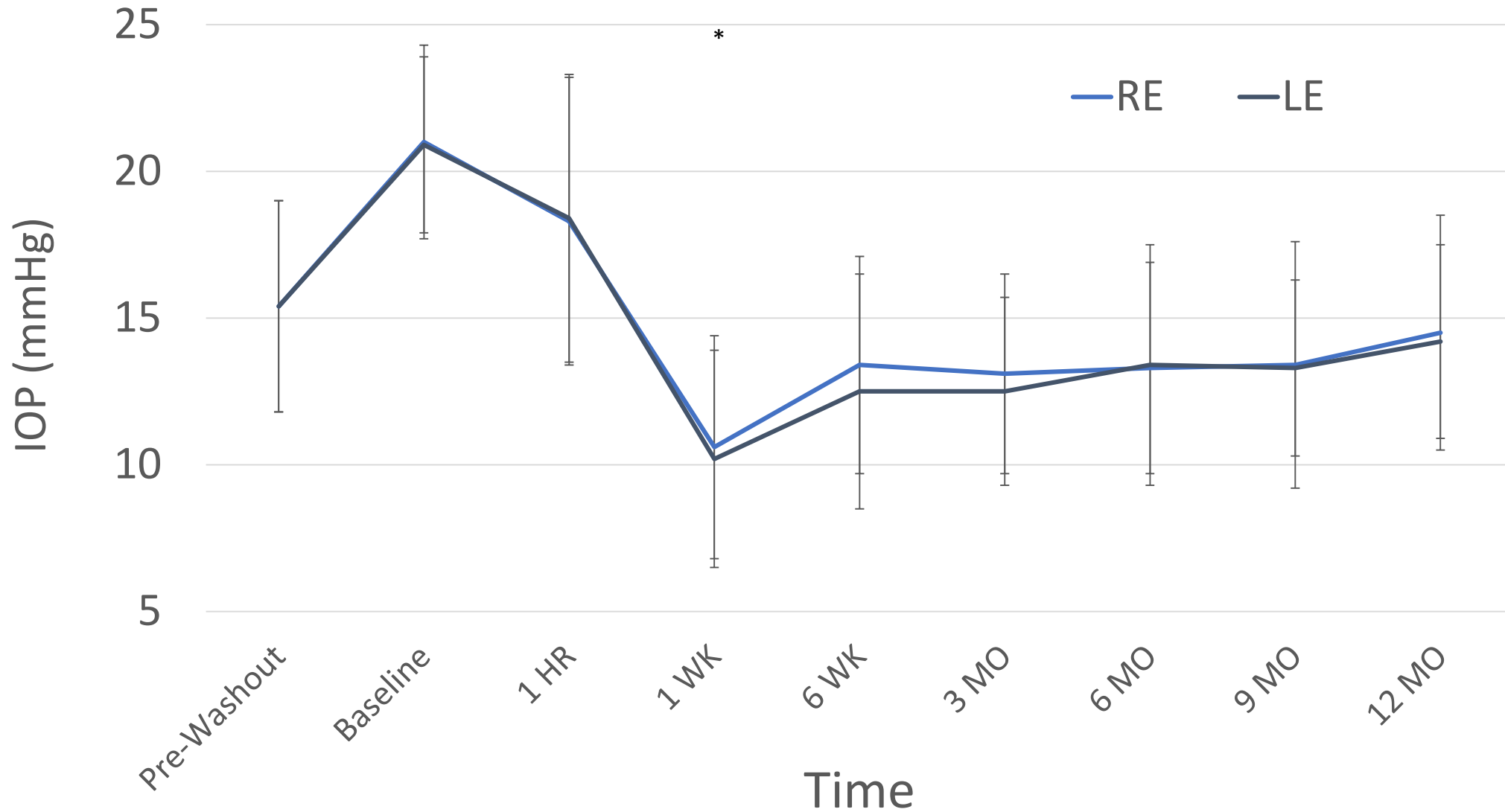
AMERICAN JOURNAL OF OPTHALMOLOGY®

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

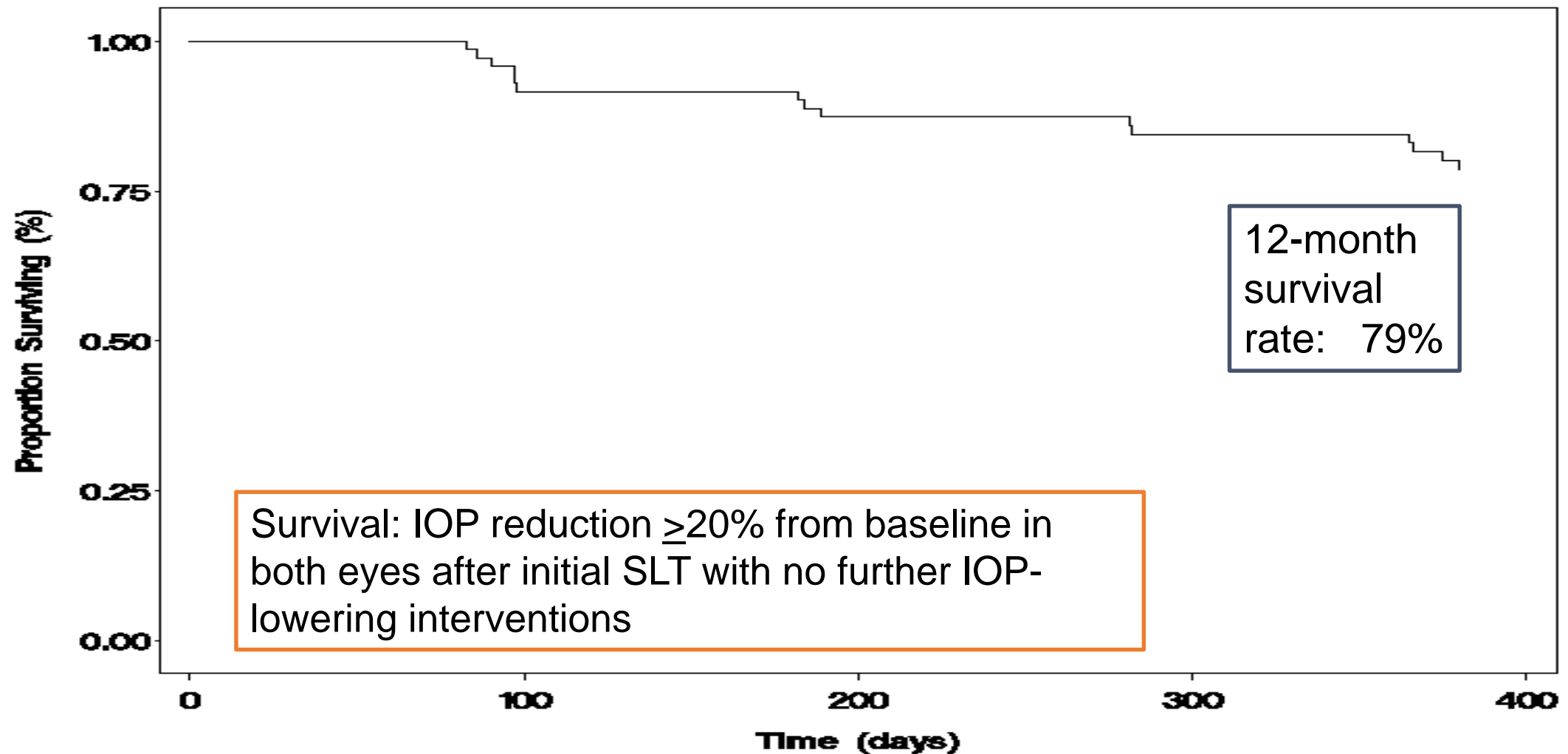
TONY REALINI, HAZEL SHILLINGFORD-RICKETTS, DARRA BURT, AND GOUNDAPPA K. BALASUBRAMANI

Am J Ophthalmol 2017;184:28–33.

Mean IOP Through 12 Months

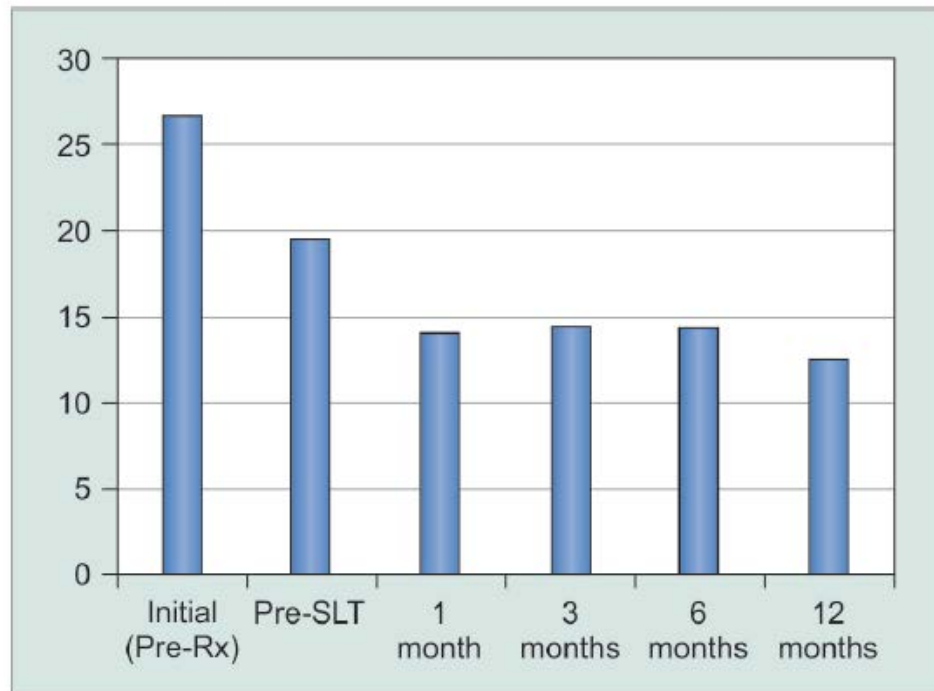


12-Month Survival Analysis: First SLT



Racial Differences in Selective Laser Trabeculoplasty Efficacy

¹Emil Goosen, ²Kate Coleman, ³Linda Visser, ⁴William E Sponsel



Graph 1: Total group IOP response ($p < 0.0001$ for pre-SLT vs all four post-SLT assessments)

12-month IOP
reduction of 42.4% in
African eyes with
POAG

IOP reductions of
 $\geq 20\%$ seen in 90% of
eyes at 12 months

Communication de la SFO

La trabéculoplastie au laser sélectif (TLS) : notre expérience chez le noir africain

Selective laser trabeculoplasty (SLT): Our experience in African blacks ☆

S.M. Seck ^a  , G. Agboton ^a, M. Dieng ^a, M.N. Ndiaye Sow ^a, M. Diakhate ^a, N.N. Gueye ^a, C.M. Seck ^b, A. Lam ^b

- Study conducted in Senegal
- Goal was medication reduction in medically controlled eyes
- At 12 months:
 - 90% overall response rate (IOP < 21 mmHg)
 - 60% were able to discontinue at least 1 medication
 - 30% mean IOP reduction



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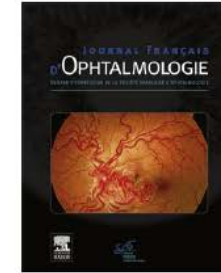
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ARTICLE ORIGINAL

Trabéculoplastie sélective chez le mélanoderme africain



Selective laser trabeculoplasty in African blacks

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A. Ouattara^b, A.J. Konan^a, L.J. Kouassi^a,
R. Béréte-Coulibaly^a, S. Boni^a, K. Gbé^a, A. Fanny^a

- Cote d'Ivoire
- 6 mo IOP reduction 27%
- 80% with ≥ 3 mmHg IOP reduction at Month 6

Efficacy Summary

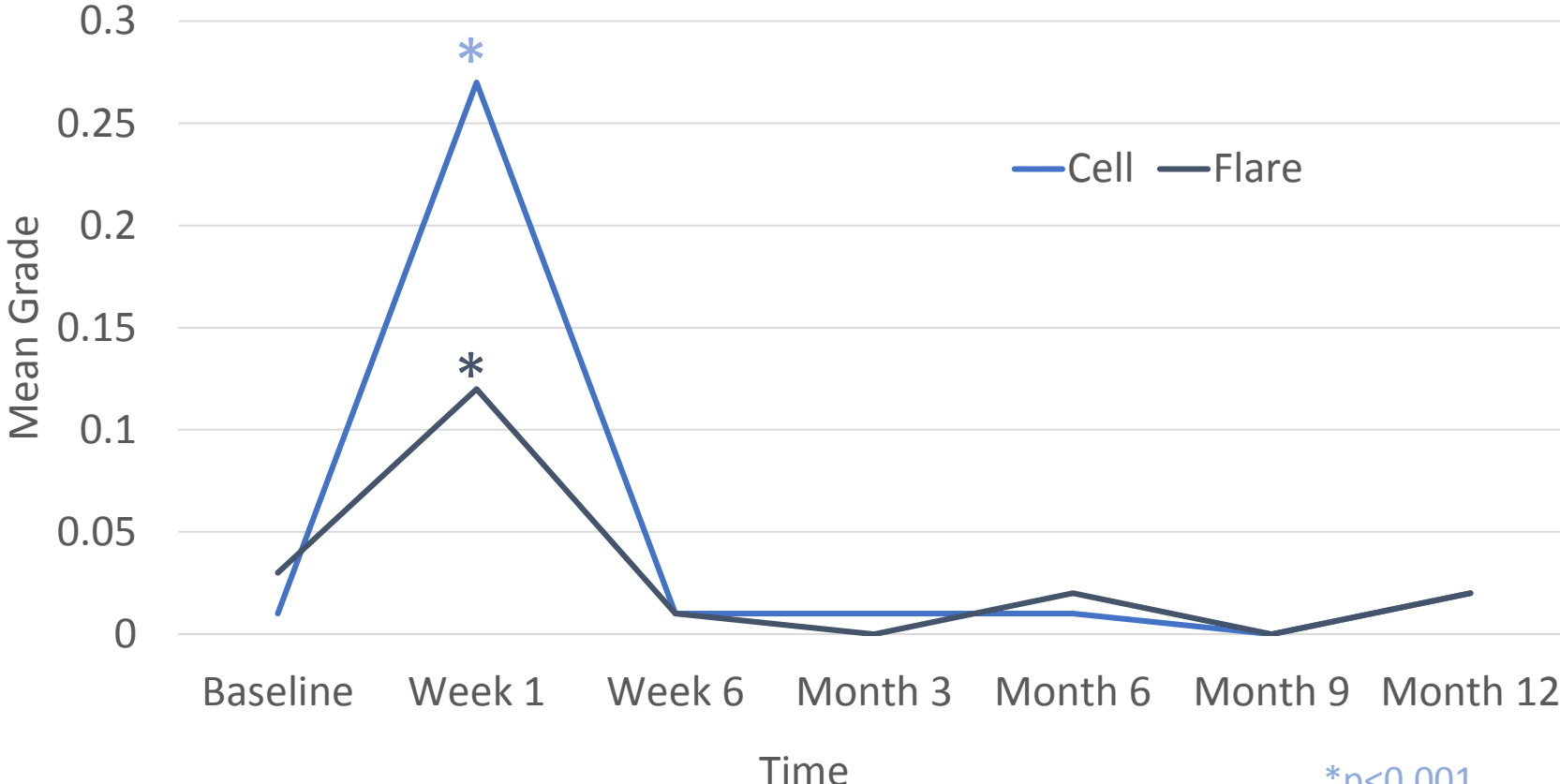
- High response rates (80-90%)
- Substantial IOP reductions (30-40%)
- Reduces reliance on medications
- Long duration of effect (up to 5 years or longer)

SLT in Africa: Safety

IOP Spikes

Study	Frequency of IOP Spikes
Saint Lucia (Realini)	4.9%
WIGLS (Realini)	2.8%
Durban, SA (Goosen)	NR
Senegal (Seck)	NR
Cote d'Ivoire (Ouattara)	NR

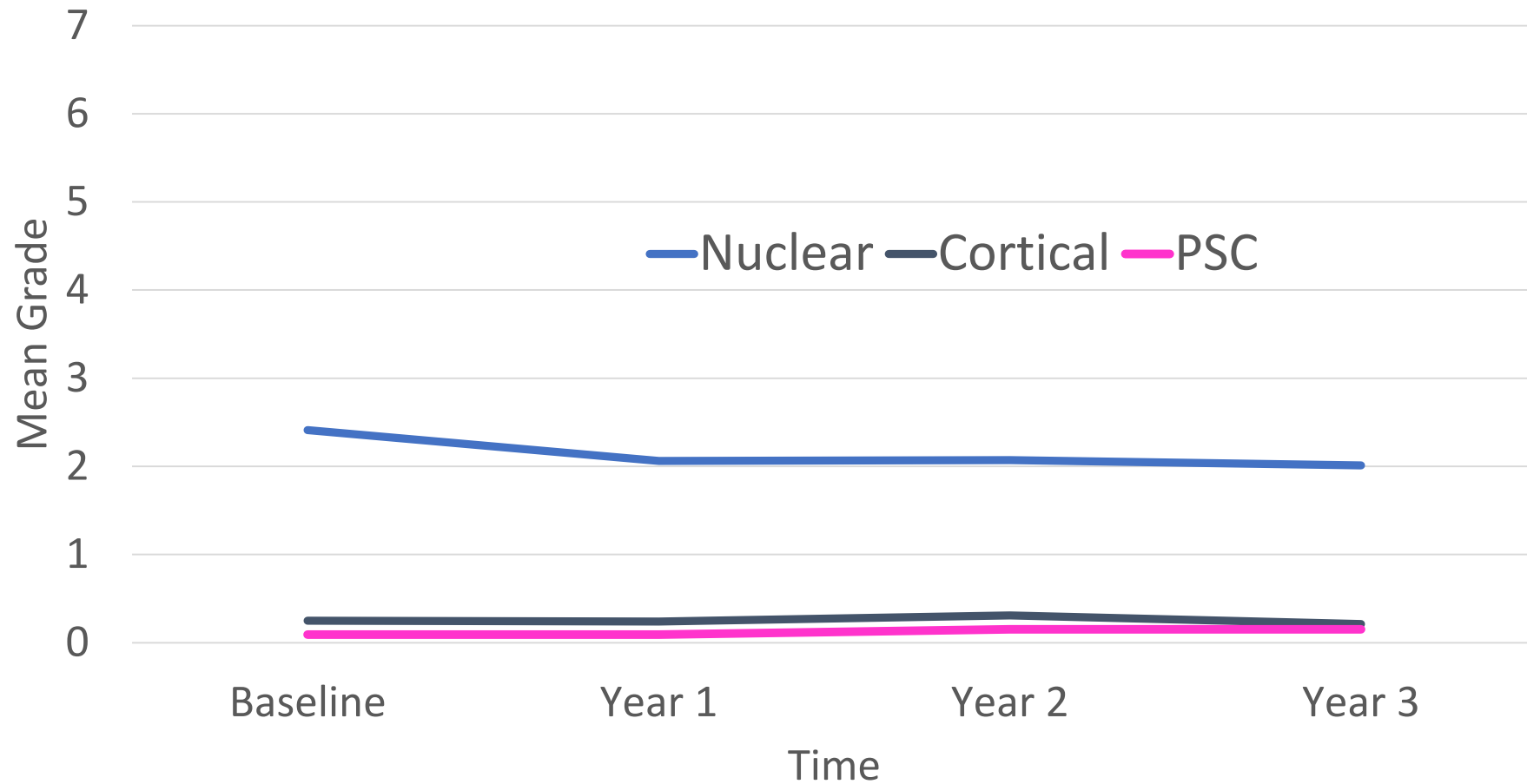
WIGLS: Inflammation after SLT



Realini et al. J Glaucoma 2019 (in press)

*p<0.001
*p=0.015

WIGLS: Lens Changes after SLT

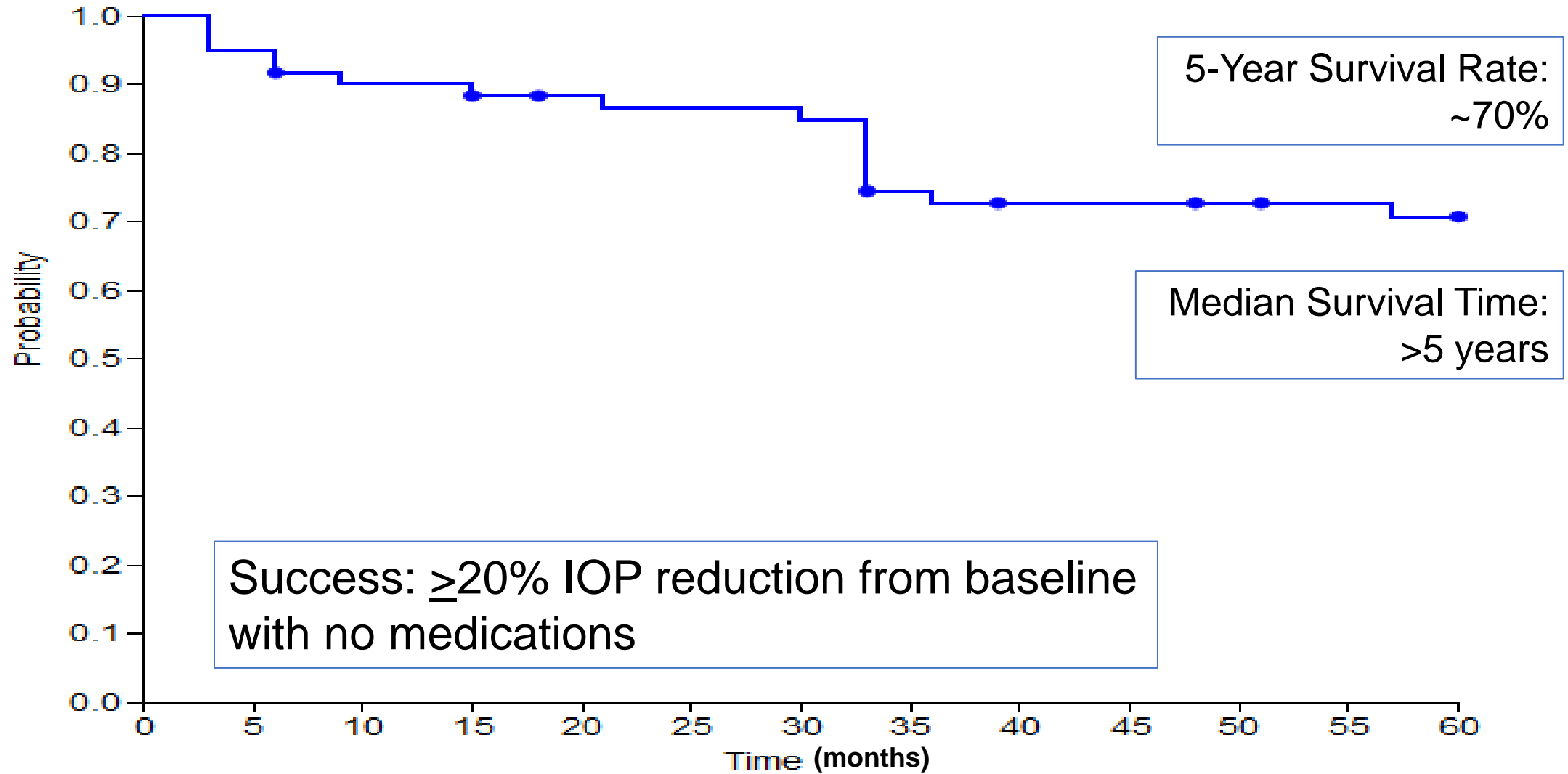


Safety Summary

- IOP spikes consistent with other populations
- No clinically relevant anterior chamber inflammation
 - No need for prophylactic anti-inflammatory therapy
- Not cataractogenic
- No known sight-threatening complications of SLT in this population

SLT in Africa: Adherence

First SLT: Survival Analysis



SLT in Africa: Cost

Cost-effectiveness of Medications Compared With Laser Trabeculoplasty in Patients With Newly Diagnosed Open-Angle Glaucoma

Joshua D. Stein, MD, MS; David D. Kim, BS; Will W. Peck, BS;
Steven M. Giannetti; David W. Hutton, PhD

Objective: To determine the most cost-effective treatment option for patients with newly diagnosed mild open-angle glaucoma: observation only, treatment with generic topical prostaglandin analogs (PGAs), or treatment with laser trabeculoplasty (LTP).

Methods: Using a Markov model with a 25-year horizon, we compared the incremental cost-effectiveness of treating newly diagnosed mild open-angle glaucoma with PGAs, LTP, or observation only.

Results: The incremental cost-effectiveness of LTP over no treatment is \$16 824 per quality-adjusted life year. By comparison, the incremental cost-effectiveness of PGAs over no treatment is \$14 179 per quality-adjusted life year, and they provide greater health-related quality of life rela-

tive to LTP. If PGAs are 25% less effective owing to poor patient adherence, LTP can confer greater value.

Conclusions: Prostaglandin analogs and LTP are both cost-effective options for the management of newly diagnosed mild open-angle glaucoma. Assuming optimal medication adherence, PGAs confer greater value compared with LTP. However, when assuming more realistic levels of medication adherence (making them 25% less effective than the documented effectiveness reported in clinical trials), at current prices for PGAs, LTP may be a more cost-effective alternative.

Arch Ophthalmol. 2012;130(4):497-505.
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doi:10.1001/archophthalmol.2011.2727

Cost-Effectiveness of Glaucoma Interventions in Barbados and Ghana

John S. Wittenborn*, and David B. Rein†

ABSTRACT

Purpose. More than 90% of blindness worldwide exists in the developing world, but information on the social and economic burden and the cost-effectiveness of treatment in these settings is often limited or nonexistent. We demonstrate the use of computer modeling to simulate the current and future epidemiology, outcomes, and treatment of primary open-angle glaucoma in high-incidence populations of the developing world.

Methods. A previously validated vision model was modified to simulate the incidence progression and social and economic outcomes of glaucoma in Barbados, which was the source of epidemiology data, and Ghana, which has similar propensity for glaucoma but lower socioeconomic development. We then assessed the cost-effectiveness of hypothetical case-finding and treatment scenarios, including U.S. guideline-level care and one-time laser surgery.

Results. Barbados incurs relatively greater social and economic burden from glaucoma than Ghana. In Barbados, population screening followed by U.S. guideline levels of care appears to be highly cost-effective. Because of a younger population with higher mortality at younger ages, glaucoma appears to cause less visual impairment and blindness in Ghana than in Barbados, resulting in lower per capita disability and productivity losses. Population screening or guideline-level treatment scenarios were generally not cost-effective in Ghana, but treating self-referring patients with a hypothetical one-time laser surgery was highly cost-effective relative to World Health Organization willingness to pay thresholds.

Conclusions. The social and economic burden of glaucoma is higher in developed nations because of increased life expectancy, an older population age profile, and higher per capita gross domestic product. Similarly, lower mortality rates and higher per capita gross domestic product increase the relative cost-effectiveness of screening and treatment interventions intended to mitigate glaucoma burden.

(Optom Vis Sci 2011;88:155–163)

SLT in Africa: Availability

African Glaucoma Consortium

Working together to eradicate blindness from glaucoma in Africa

About us

The African Glaucoma Consortium (AGC) was established to reduce the burden of glaucoma blindness in Africa by creating consensus among stakeholders, building sustainable, regional capacity to deliver high quality, low cost care, and fostering demand for this care in communities throughout Africa.

www.AfricanGlaucoma.com