Selective Laser Trabeculoplasty in a rural sub-Saharan African population

Background

- Glaucoma is a major cause of irreversible blindness worldwide and incidence is higher among those of African descent. (1)
- Limited resources and poor medical literacy make glaucoma treatment difficult in rural, low-income regions of Africa. (2)
- Selective laser trabeculoplasty (SLT) is a non-invasive, cost-effective laser treatment that selectively targets pigmented cells in the trabecular meshwork to reduce intraocular pressure (IOP). It can be used as a first line treatment. (3)
- The majority of patients included in landmark studies of SLT are of European ancestry. (3)
- Because SLT acts on pigmented trabecular meshwork cells, there are reports that SLT may be more effective in individuals of African descent, however this has been debated. (4-6)
- We regularly employ SLT as treatment for primary open angle glaucoma (POAG) at our eye clinic in Malawi.

Objective

This observational study evaluates the efficacy of SLT in a rural sub-Saharan African population .

Methods

This is an observational study that includes individuals over age 18 who received SLT as part of their glaucoma management at our eye clinic in rural Malawi. All eyes treated with SLT by a single physician between June 2016 and June 2022 were included. Rates of treatment success were evaluated. IOP was measured using Goldmann applanation tonometry. Postop pressure spikes were treated with topical IOP-lowering medication in clinic.

Definition of success

IOP reduced ≥20% from baseline

Follow-up visits

1 week
1 month
3 months
6 months

SLT laser settings

Spot size: 400µm
Power: 0.3 – 1.6mJ
Degrees Treated: 360
Target # of Spots: 100

Results

One hundred eighty-nine eyes of 155 patients were included in this study. Baseline and follow up data are summarized in the tables and graph below.

Table 1.

Baseline Characteristics	
Age ±std dev	61±16
Percent female	28.4
# Laser spots ±std dev	112±39
Laser power, mJ ±std dev	1.5±0.3

Graph1. Success rates and intraocular pressure

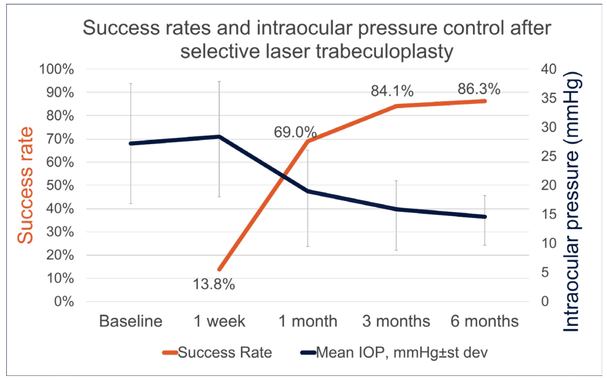

Table 2. Intraocular pressure control and success rates after selective laser trabeculoplasty

	Baseline	1-Week	1-Month	3-Months	6-Months
n	191	188	187	164	117
Mean IOP, mmHg ±std dev	27.2±10	28.4±10	19.0±7	15.9±5	14.6±4
Success Rate (IOP reduced ≥20%)	-	13.8%	69.0%	84.1%	86.3%

Discussion

- This study observed good IOP control with SLT in this rural sub-Saharan African population.
- Mean IOP reduction was 46%, which is higher than results typically reported in the literature (3,4,7).
- This increased IOP reduction may be due to many factors, including higher baseline IOP than other studies.
- Other factors contributing to improved IOP reduction (such as race) have not been ruled out in this study.
- Although most patients achieved a 20% or greater IOP reduction, many were still not at IOP goal and would require additional IOP-reducing interventions (topical medication, incisional surgery, etc.).

Conclusion

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