Original Article

Challenges with Trabeculectomy at University of Nigeria Teaching Hospital Ituku-Ozalla Enugu, Nigeria: Ophthalmologists' Perspectives

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ABSTRACT

Background: Black Africans are more vulnerable to primary open angle glaucoma, which runs a catastrophic course. Primary trabeculectomy with anti-metabolites has been recommended as the suitable therapeutic option. Yet, a low glaucoma surgical rate (GSR) has been documented in Nigeria. **Aim:** To evaluate the challenges with performing trabeculectomy at the University of Nigeria Teaching Hospital (UNTH) Ituku-Ozalla, Enugu from the Ophthalmologists' perspectives with a view to improving the GSR in Nigeria. **Methods:** A cross-sectional study design with a qualitative method was adopted for this study in July 2023. It involved 18 participants (ophthalmologists) from UNTH, comprising the (12) senior registrars for the focus group discussion, and a purposive sample of 6 consultants for the in-depth interviews. Discussions and interviews were recorded and transcribed. The transcripts were analysed using the Braun and Clarke guide to thematic content analysis. **Results:** Poor surgical skill acquisition, with the consequent inadequate transfer of skills to trainees was the major challenge. Availability of better alternatives, the inherent lack of vision improvement following trabeculectomy and inability to pay for surgery, which translated to low uptake of trabeculectomy by patients were also important findings. Improved glaucoma surgical training, health insurance, hospital subsidy, public health education and individual patient's counselling were the recommendations to improve the GSR. **Conclusion:** In UNTH Enugu, providers, patients, and glaucoma disease factors were identified as challenges with trabeculectomy. Strategies to address them especially, simulation-based glaucoma surgical training for trainers and trainees are advised to improve the situation.

Keywords: *Enugu Nigeria, Providers perspective, trabeculectomy*

Introduction

Globally, glaucoma is the commonest cause of irreversible blindness and the second leading cause of blindness among persons aged 50 years and older.[1] It is projected to affect 111.8 million people in 2040.[2] Currently, Africa has the highest prevalence (4.2%) of primary open angle glaucoma (POAG).[2] In Nigeria,[3] glaucoma was accountable for 16.7% of blindness, with a prevalence of 5.02%, where it runs a more progressive and catastrophic course, given its younger age of onset[4] and advanced, irreversible loss of visual function at presentation.[5]

Trabeculectomy is the most performed glaucoma incisional surgery,[6,7] despite the current trends toward minimally invasive glaucoma surgeries.[8] It has been recommended as the suitable therapeutic option in Africa,[9] yet the recent glaucoma surgical rate for Nigeria was found to be 4, instead of the estimated target of 50 glaucoma surgeries per million population annually.[10] Reports on the possible reasons for the low GSR dwelt more on the patients' challenges[7,11,12]

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with glaucoma treatment and a few[11,13] on providers' perspectives.

The study[11] on ophthalmologists' practice of trabeculectomy in Nigeria was via self-administered questionnaire and not quite explorative. It was conducted 13 years ago, when the trend toward subspecialization was yet to be significant. In the University of Nigeria Teaching Hospital Enugu, using the year 2022 records, the number of trabeculectomies performed and the average number of trabeculectomies per surgeon per year was very low (unpublished operating theatre records).

This study therefore sought to do an in-depth exploration of the challenges with trabeculectomy from the ophthalmologists' perspectives, using focus group discussions (FGDs) and in-depth interviews (IDIs). Findings from this study shall inform policies and strategies on improving surgical glaucoma care with the aim of improving the GSR thereby, reducing the prevalence of blindness due to glaucoma in Enugu, Nigeria, and other resource-limited settings.

Methods

Study site

The University of Nigeria Teaching Hospital, (UNTH), Ituku-Ozalla, Enugu, is one of the major Federal Government-owned tertiary health institution in the south-east region of Nigeria.[14] It serves mainly Enugu State population as well as the neighboring states. Patients from other parts of Nigeria are also seen on referral basis.

The ophthalmology department has established residency training program. It offers comprehensive and specialized eye care services: glaucoma, vitreo-retina, oculoplasty, anterior segment, pediatric and public health ophthalmology. Glaucoma clinical and surgical services are offered on daily basis from Monday to Friday.

Study design

This was a cross-sectional study design using a qualitative method. It involved the use of FGDs with the senior registrars and IDI with the consultants with the stated topic guides to explore the challenges with performing trabeculectomy and recommendations on how to improve its uptake. It was done over a 6-week period between June and July 2023.

Study population

The study involved 18 participants (6 consultants and 12 senior registrars) from a pool of the 30 ophthalmologists (15 consultants, 12 senior, and 3 junior registrars) working at UNTH as at the time of the study. Their prevailing practice pattern was both comprehensive and subspecialties. Even though, 2 out of the 15 consultants were glaucoma specialists, all of them were expected to perform trabeculectomy as part of their comprehensive ophthalmology practice.

Eligibility criteria

Ophthalmologists who voluntarily consent to participation and were available for the study.

Sampling technique

For the IDIs, a purposive sampling technique was used to select 6 participants: the 2 glaucoma specialists and 4 other ophthalmologists (2 consultants with greater than 10 years of practice and the other 2 within 10 years). The 2 glaucoma specialists were selected because of their rich experiences with performing trabeculectomy. The other 4 ophthalmologists were selected according to years of practice to highlight the impact of the recent (within the past 10 years) trends toward subspecialization in ophthalmic practice in Nigeria.

The FGDs involved all the senior registrars, and they were in their 5th and 6th year of training in UNTH. The senior registrars were selected because as at the time of study, the junior registrars were just 3 months old in residency.

Ethics considerations

Ethical approval was sought from the Ethics Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, Nigeria, with the approval number: NHREC/05/01/20088-FWA00002458-IRB00002323. Written informed consent was obtained from each participant following a detailed explanation of the study. The anonymity of participation and confidentiality of participants' responses were respected and guaranteed. There were no anticipated risks to the participants.

Data collection instrument

This comprised two topic guides for the FGDs and the IDIs. The FGDs with the senior residents focused on the general description of their glaucoma surgical skill acquisition and training, challenges with performing trabeculectomy, and the possible remedies. The IDIs with the consultants in addition focused on the challenges with training the residents on trabeculectomy.

Pilot study

The IDI topic guide questions were pretested with one consultant ophthalmologist from Owerri, outside the study area and FGDs with 3 senior registrars.

Study procedure

Recruitment emails with the participants' information sheet and informed consent form were sent to the participants. Those who did not respond promptly were reached over a phone call. Participants were referred to as pseudonyms, assigned "R" for residents and "C" for consultants followed by an identification number (e.g. "R1" and "C1").

IDIs with the ophthalmic consultants: a scheduled, 30-minute, face-to-face, recorded interview was conducted with each of the selected consultants in their offices. They were one–off interview with each consultant. Uniformity was ensured using the same topic guide.

FGDs with the senior residents: face-to-face, 60-minute, recorded discussions were scheduled and conducted in the quiet of their conference room. It was a group discussion which involved all the participants with the researcher directing it with the topic guide questions.

Data analysis

The audio recordings done in English language were transcribed verbatim, using voice-to-text software. Thereafter, to ensure quality assurance, the transcripts were reviewed and compared with the original recordings to identify missed and misheard words, which were filled in and corrected within the text. This was done by the principal investigator and two authors independently to prepare an unbiased interpretation of the transcripts, which were analyzed using the Braun and Clarke 6-step Guide to Good Thematic Analysis.[15] Following familiarization and reflections on the responses, codes were generated and analyzed to yield themes and subthemes. These themes were reviewed and refined for presentation. Quotes supporting the themes were used when interpreting the results.

Results

Participants' profile

The participants comprised more males, 11 (58.0%) with a mean age of 45.5 ± 16 SD years. Other details are shown in Table 1.

Challenges with performing trabeculectomy from the providers perspectives

These were summarized as themes and subthemes in Table 2, as expressed below.

Poor surgical skill acquisition and inadequate transfer of skills to trainees

"Very few trainers are skilled in trabeculectomy. Some of our trainers are not eager to offer trabeculectomy as an option for glaucoma patients, even when it is obviously indicated. Hence, we tend to suspect that they are not properly skilled with trabeculectomy" (R3).

Table 1: Participants' identification and position

ID	Participants
C1 - C2	Ophthalmic Consultants (glaucoma specialists)
C3 - C4	Ophthalmic Consultants (>10 years of practice)
C5 - C6	Ophthalmic Consultants (< 10 years of practice)
R1 – R3	Ophthalmic senior Registrars [6th (final) year]
R4 – R12	Ophthalmic senior Registrars (5th year)

Table 2: Themes and subthemes from challenges with performing trabeculectomy

	Themes	Subthemes
1	Surgeons' lack of proficiency at trabeculectomy	• Poor surgical skill acquisition and inadequate transfer of skills to trainees • Surgeons' preference for "better alternatives" – medical and laser therapies • Surgeons' apathy/Fear of complications/Fear of litigation
2	Low uptake of trabeculectomy by patients	• Poor patients' motivation with regards to vision outcome. • Inability to pay for the surgery
3	Misconceptions about trabeculectomy	• Glaucoma is not a surgical disease • Surgery is a permanent cure

Table 3: Themes and subthemes from remedies for the challenges with trabeculectomy

	Themes	Subthemes
1	Improve surgical skill acquisition	Activate wet-lab and hands-on training Residents' postings to high volume centers Simulation-based glaucoma surgical training for the trainers and trainees.
2	Health education	Public eye health education via the media Patients' counseling sections in clinics
3	Payment for surgery	Health insurance Sponsored care Hospital subsidy

"Every emphasis in surgical ophthalmology is on cataract. None is being placed on glaucoma" (R2).

"Everyone is interested in cataract patients, who are happy with you immediately after surgery and you feel good too. But, glaucoma …., one needs to be really passionate about it" (C6).

"Then the issue of having the correct tools to work with, we do not have laser suture lysis to titrate the intraocular pressure, doing the releasable sutures ……., so how can you sleep properly days and weeks after just one trabeculectomy" (C2).

"Our patients usually present with an only eye and if eventually they accept surgery, you would not want the trainees to try their hands on this only eye" (C1).

Preference for "better alternatives"—medical and laser therapies

With the availability of competing therapeutic options in glaucoma care, ophthalmologists tend to relegate trabeculectomy to the last position.

"So, because of the problems peculiar with trabeculectomy, I offer it as an end option, that is, when maximal medical therapy fails" (C1).

"In this center, drug treatment is offered by default, and we are being conditioned to offer it by default. We do not know the reasons, probably because of low confidence in surgical glaucoma care" (R10).

"In this emergent era of LASERs for glaucoma, I don't think I will offer trabeculectomy with all its troubles to patients. I rather earn my sleep with repeated lasers and medical therapy" (C5).

Surgeons' apathy/fear of complications/fear of litigation

"Surgeons are shy in offering trabeculectomy as a treatment option for glaucoma patients because they are not proficient. The postoperative period is quite tasking and highly demanding. I had a terrible experience recently with managing a flat anterior chamber with the wrong viscoelastic, the following day the whole cornea became white, vision was eventually lost in that eye. Currently, I am scared" (C3).

"In this present era, patients and their relatives are well-informed and exploitative, so I only discuss surgery, when I am sure that the patient is literate and completely understands the truth about glaucoma vision after surgery and still requests for it"(C1).

Low uptake of trabeculectomy by patients

"Our patients usually present at the advanced stages with only a seeing eye, and the teaching is to operate on the better eye. The patient wonders why you are not operating on the worst eye, the non-seeing eye. So, many of them decline" (C2),

Poor patients' motivation with regards to vision outcome

"Also, the whole truth about glaucoma surgical option scares patients away from accepting trabeculectomy—your vision would not be better after surgeries, but your eye pressures would be reduced to preserve your remaining vision, you require follow-up for life and may be back to drops. Then, the patient would say, let me go and discuss with my family and you would never see them again" (C1).

Inability to pay for surgery

"Cost of managing glaucoma patients is a big challenge in our environment. Most of our patients are rural and poor. They can't meet up with the demands of managing glaucoma, the lifelong eye drops. They can't pay for the cost of surgery, if indicated" (C3).

Misconceptions about surgery

"There is this common knowledge that glaucoma is not surgical disease, even among the non-ophthalmic doctors. So, patients are unwilling to accept it. Their families and friends advise them and would not support surgery in any form" (R3).

"Most of our patients are poor and illiterate. They believe that surgery is a final cure, just like their cataract counterparts. So, they don't come for review anymore" (C4).

Remedies

These were summarized as themes and subthemes in Table 3, as expressed below.

Improve surgical skill acquisition

"Training and retraining the trainers is the remedy" (R8).

"Training residents with the nonseeing eyes would be a good option, but then who funds the surgeries" (C1).

"Our trainers should emphasize trabeculectomy as much as they do on cataract surgery" (R5).

Activate the wet-lab and hands-on training

"Structured and monitored wet-lab training should always be in place" (C1).

"I had to travel all the way to Ghana to acquire the 2-weeks surgical training by Moorfields. I now offer trabeculectomy to patients "(C5).

Outside posting of residents to high volume centers

"Go to other centers, where their residents go for these postings and see how they compete with consultants for surgeries. But here, they keep giving reasons – insecurity, etc….. " (C1).

Simulation-based glaucoma surgical training for the trainers and trainees

"Given the peculiarities in our settings, establishing simulation-based surgical training centers might be quite helpful. This is what is obtainable in most places, especially in the developed world" (C6).

Public eye health education via the media

"Widespread patients' information via the media, the churches, women and men groups, etc." (R7).

Patients' counseling sections in clinics

"We have to establish a counselling unit in our department, where patients are counseled and educated properly on benefits of trabeculectomy" (C1).

Payment for surgery via health insurance, sponsored care, and hospital subsidy

"Cushioning the cost of glaucoma treatment is very important to our patients. Establishing a glaucoma patients' association provides a forum where pharmaceutical companies and philanthropists are approached to donate freely and subsidize cost to patients" (C2).

"Let there be sponsored trabeculectomy by philanthropists and nongovernmental organizations (NGOs) and subsidy by our hospital management just like we do with cataract surgeries" (R6).

Discussion

Generally, glaucoma subspecialty is yet to be strictly a practice on its own, in Nigeria.[16] Ophthalmologists including the glaucoma specialists are still involved in comprehensive ophthalmic practice. Therefore, acquisition of trabeculectomy surgical skills is still a compulsory aspect of ophthalmology residency training in Nigeria.

Surgeons' lack of proficiency was identified as a major reason for the low number of trabeculectomies performed in this study site. A similar study[11] conducted 13 years ago in Nigeria also cited insufficient skill acquisition. It is surprising that over these years, even with the expected transformation from internationally sponsored subspecialty training of glaucoma fellows,[17] the lag still lingers. One would expect improved surgical skills and transfer to trainees compared with previous reports in Nigeria,[11,18] when the trend towards subspecialization was yet to be significant.

On the contrary, it was observed in the United Kingdom that 50% of the trainees in their exit year were self-assured with trabeculectomy.[19] Similar confidence was reported in India[20] and US.[21] The fact that the ophthalmology residency in the United Kingdom is planned to flow with a comprehensive competency-based curriculum with emphasis on simulation-based surgical training may explain this difference. Adoption of this training design in Enugu Nigeria may boost the trainees' confidence, which has also been shown to improve surgical training and competency in resident ophthalmologists, elsewhere in sub-Saharan Africa.[22] In addition, activation of wet-lab and hands-on training at high-volume centers is highly recommended, as suggested in the present study.

Low uptake of trabeculectomy by patients was stated as a challenge to performing trabeculectomy. Poor patients' motivation with regards to vision outcome was the main reason in this study. Likewise, several studies[7,11,16] documented a low rate due to poor patients' acceptance. This reiterates the need for comprehensive patients' counselling, communication and support groups, where the benefits of surgery are explained and emphasized to the patients. Public eye health education via the media to refute the misconceptions about glaucoma in the present study areas is also desirable to improve uptake, as most patients rely on family and friends' advice and support.

Nonetheless, a decline in the uptake of trabeculectomies has also been observed in the United Kingdom,[23] United States,[24] and Australia.[25] The availability of competing glaucoma therapeutic options such as more potent medications, lasers and MIGS may explain this observed trend.[8] This was further emphasized in the present study by the surgeons' preference for "better alternatives."

Future studies should therefore be designed in resource-limited settings to reach a consensus whether the previous recommendation[9] on primary trabeculectomy as a first line treatment in Africa still stands. The time for a paradigm shift may be now.

It is not surprising that inability to pay for surgery was an important issue in this study. There is a poor coverage of the National Health Insurance Scheme with about 73% of patients using out-of-pocket expenditure to pay for healthcare.[26] This is in contrast to the high health insurance coverage obtainable in the developed world.[24] Therefore, strategies, such as universal health insurance, sponsored care and hospital subsidy to improve payment for trabeculectomy should be put in place to improve the GSR in this study setting.

Study strength and limitations

The strength of this study lies in its explorative design. It was limited by its inherent small sample size.

Conclusion

In Enugu, Nigeria, providers, patients, and glaucoma disease factors were identified as challenges with trabeculectomy. Strategies to address them especially, simulation-based glaucoma surgical training for trainers and trainees are advised to improve the situation.

Future research should explore the challenges with trabeculectomy from the patients' perspective in the study area.

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Conflicts of interest

There are no conflicts of interest.

References

1. GBD 2019 Blindness and Vision Impairment Collaborators; Vision Loss Expert Group of the Global Burden of Disease Study. Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to VISION 2020: The Right to Sight: An analysis for the Global Burden of Disease Study. Lancet Glob Health 2021;9:e144-60.
2. 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;121:2081-90.
3. Abdull M, Sivasubramaniam S, Murthy G, Gilbert C. Causes of blindness and visual impairment in Nigeria: The Nigeria national blindness and visual impairment survey. Invest Ophthalmol Vis Sci 2009;50:4114-20.
4. Bonnemaijer PWM, Lo Faro V, Sanyiwa AJ, Hassan HG, Cook C; GIGA study group; Van de Laar S, *et al*. Differences in clinical presentation of primary open-angle glaucoma between African and European populations. Acta Ophthalmol 2021;99:e1118-26.
5. Olawoye O, Kizor-Akaraiwe N, Pons J, Sarimiye T, Washaya J, Hughes S, *et al*.; STAGE Research Group. Clinical characteristics and stage at presentation of glaucoma patients in Sub-Saharan Africa. J Glaucoma 2022;31:717-23.
6. Rodriguez-Una I, Azuara-Blanco A, King AJ. Survey of glaucoma surgical preferences and post-operative care in the United Kingdom. Clin Exp Ophthalmol 2017;45:232-40.
7. Kyari F, Nolan W, Gilbert C. Ophthalmologists' practice patterns and challenges in achieving optimal management for glaucoma in Nigeria: Results from a nationwide survey. BMJ Open 2016;6:e012230.
8. Luebke J, Boehringer D, Anton A, Daniel M, Reinhard T, Lang S. Trends in surgical glaucoma treatment in Germany between 2006 and 2018. Clin Epidemiol 2021;13:581-92.
9. Cook C. Glaucoma in Africa: Size of the problem and possible solutions. J Glaucoma 2009;18:124-8.
10. Eni EN, Nolan W, Eval B, Buchan JC. What glaucoma surgical rate could serve as a target for West Africa? A systematic review. J Curr Glaucoma Pract 2021;15:19-27.
11. Kizor-Akaraiwe NN, Ogbonnaya CE. Practice of trabeculectomy by ophthalmologists in Nigeria. Niger J Clin Pract 2017;20:507-11.
12. Fadamiro CO, Ajite KO. Acceptability and barrier to consideration for trabeculectomy among glaucoma patients in a tertiary hospital in South Western Nigeria. Adv Ophthalmol Vis Syst 2020;10:86-9.
13. Adekoya BJ, Adepoju FG, Moshood KF, Balarabe AH. Challenges in the management of glaucoma in a developing country; A qualitative study of providers' perspectives. Niger J Med 2015;24:315-22.
14. UNTH. Available from: https://unth.edu.ng/about-unth/history/. [Last accessed on 2023 Feb 16].
15. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol 2006;3:77-101.
16. Onwubiko SN, Udeh NN, Nkwegu O, Ukwu DO, Nwachukwu NZ. Glaucoma care in Nigeria: Is the current practice poised to tackle this emerging sight-threatening disease? Int Ophthalmol 2019;39:2385-90.
17. Commonwealth Eye Health Consortium. Available from: https://cehc.lshtm.ac.uk/clinical-fellowships-2. [Last accessed on 2023 Feb 16].
18. Adekoya BJ, Onakoya AO, Shah SP, Adepoju FG. Surgical output and clinic burden of glaucoma in Lagos, Nigeria. J Glaucoma 2014;23:41-5.
19. Dean WH, Grant S, McHugh J, Bowes O, Spencer F. Ophthalmology specialist trainee survey in the United Kingdom. Eye 2019;33:917-24.
20. Ajay K, Krishnaprasad R, Divya DS. Ophthalmic surgical training in Karnataka and Southern India: Present status and future interests from a survey of final-year residents. Indian J Ophthalmol 2015;63:306-11.
21. Abdelfattah NS, Radwan AE, Sadda SR. Perspective of ophthalmology residents in the United States about residency programs and competency in relation to the International Council of Ophthalmology guidelines. J Curr Ophthalmol 2016;28:146-51.
22. Annoh R, Buchan J, Gichuhi S, Philippin H, Arunga S, Mukome A, *et al*. The impact of simulation-based trabeculectomy training on resident core surgical skill competency. J Glaucoma 2023;32:57-64.
23. Murphy C, Ogston S, Cobb C, MacEwen C. Recent trends in glaucoma surgery in Scotland, England and Wales. Br J Ophthalmol 2015;99:308-12.
24. Arora KS, Robin AL, Corcoran KJ, Corcoran SL, Ramulu PY. Use of various glaucoma surgeries and procedures in medicare beneficiaries from 1994 to 2012. Ophthalmology 2015;122:1615-24.
25. Liu L, Siriwardena D, Khaw PT. Australia and New Zealand survey of antimetabolite and steroid use in trabeculectomy surgery. J Glaucoma 2008;17:423-30.
26. National Eye health Policy: Universal eye care services towards universal health coverage. Federal Ministry of Health, Nigeria. 2019. Available from: https://www.health.gov.ng/doc/National-Eye-Health-Policy.pdf. [Last accessed on 2023 Feb 16].