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ORIGINAL PAPER

Glaucoma care in Nigeria: Is the current practice poised to tackle this emerging sight-threatening disease?

S. N. Onwubiko · N. N. Udeh · O. Nkwegu · D. O. Ukwu · N. Z. Nwachukwu

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Abstract

Purpose To investigate the current practice on glaucoma care with the aim of highlighting its poise to tackle this emerging sight-threatening disease in Nigeria.

Methods This was a cross-sectional, descriptive, population-based survey involving 88 ophthalmologists. Information on their demographic characteristics, practice profile, challenges and prospects on glaucoma care was collected using a semi-structured, self-administered questionnaire in August 2016. Data were analysed using SPSS 20.

Results The participants are comprised of 46 (52.3%) males and 42 (47.7%) females, with a mean age of 42.2 ± 8.7 SD years. They were 45 (51.1%) consultants, 31 (35.2%) residents and 12 (13.6%) diplomates. Their years of practice were 8.8 ± 6.7 SD years. They worked mainly in government hospitals located at the southern part of Nigeria. The current practice was mainly comprehensive ophthalmology, 63 (71.6%). Only 2 (2.3%) had strict subspecialty practice. Others, 23 (26.1%), had combined practice. Eleven (12.5%) were glaucoma specialists and had combined practice. The majority of the participants, 57 (64.8%), were routinely diagnosed glaucoma properly. Sixty-three (71.6%) participants underwent trabeculectomy, 48 (54.5%) combined cataract surgery with trabeculectomy, 7 (8.0%) drainage implants, 5 (5.7%) laser trabeculoplasty, and 2 (2.3%) minimally invasive glaucoma surgery. Poor patients' acceptance and satisfaction, fear of complications, lengthy post-operative care and cost were the main deterrents to surgeries. Advocacy, public awareness, training of glaucoma specialists, provision of equipment and health insurance were the major recommendations on improving glaucoma care.

Conclusion Given the meagre number of specialists and lack of strict subspecialty practice, optimal glaucoma care in Nigeria is still far from reality.

Keywords Glaucoma · Current practice pattern · Nigeria

Introduction

Worldwide, glaucoma is the commonest cause of avoidable, irreversible blindness. The global prevalence of glaucoma has been estimated to be 3.54%, with the highest prevalence in Africa, 4.79% [1]. Projections from 2013 into 2040 showed an increase by 74% from 64.3 million to 111.8 million of the global number of people with glaucoma (aged

S. N. Onwubiko (✉) · N. N. Udeh · O. Nkwegu · D. O. Ukwu · N. Z. Nwachukwu
Department of Ophthalmology, University of Nigeria Teaching Hospital, PMB 01129, Ituku-Ozalla, Enugu, Nigeria
e-mail: srstellao16@yahoo.com

40–80 years), disproportionally affecting people residing in Africa and Asia [1]. A 130.8% (10.9 million) increase is projected for Africans, consequent upon the expected dramatic increase in the number of elderly persons because of increased life expectancy in Africa [1].

In Nigeria, glaucoma accounted for more than 16% of blindness, with a prevalence of 5.02% in persons aged 40 years and above (reports from the 10-year-old national survey) [2]. Deprivation and Igbo ethnicity among others were associated with glaucoma blindness [3]. Typically, it is characterized by late presentation of advanced stages of primary open-angle glaucoma (POAG), poor adherence to medications, and poor acceptance of surgery, loss to follow-up, misconceptions and poor knowledge of the disease, challenges of cost, availability and accessibility to care [4–7].

Glaucoma is an emerging sight-threatening disease, without symptoms until advanced stages, and naturally progresses to irreversible blindness. Documented evidence has shown that early diagnosis and interventions delay glaucoma disease progression and reduce vision loss and risk of blindness [8, 9].

The foregoing background therefore underscores the need to investigate the current practice in Nigeria with the aim of highlighting its poise to tackle this emerging sight-threatening disease. These data could serve to inform policy makers on resource allocation to glaucoma care and to define a standard protocol and guideline for glaucoma care adapted to the Nigerian environment.

Methods

Eligibility Ophthalmologists, who have practised in Nigeria for more than 1 year and voluntarily gave informed consent to participation.

Ethics Prior to the start of the study, ethics clearance compliant with 1964 Declaration of Helsinki was obtained from University of Nigeria Teaching Hospital's Medical and Health Research Ethics Committee (Institutional Review Board).

Study design This was a cross-sectional, descriptive, population-based survey involving 88 consenting ophthalmologists practising in Nigeria. Information on their demographic characteristics and practice profile on glaucoma management as well as recommendations on improving glaucoma care was collected using a semi-structured, self-administered questionnaire in August 2016.

Study instrument A pre-tested, 23-item questionnaire is comprised of two sections. Firstly, the demographic profile of the participants, cadre, location, years and pattern of ophthalmic practice were inquired. Secondly, information on the following were sought: number of old and new glaucoma patients including the paediatric age group seen on monthly basis, details of glaucoma diagnosis and treatment, number of trabeculectomies and other glaucoma procedures done on monthly basis, challenges with performing trabeculectomy and, finally, recommendations on how to improve on glaucoma services in Nigeria.

Study definition For the purpose of this study, proper glaucoma diagnosis meant slit-lamp examination, fundoscopy, tonometry, perimetry and gonioscopy.

Data management Data were cleaned, edited, coded and analysed using the Statistical Package for Social Sciences (SPSS) software for windows, version 20.0 (SPSS Inc. Chicago, Illinois, USA). Data were subsequently categorized and subjected to descriptive statistical evaluation to yield frequencies, percentages and proportions. Factors predictive of performing trabeculectomy were determined using the student t test. A p level of ≤ 0.05 was considered statistically significant.

Results

Participants' demographic and practice characteristics

The participants are comprised of 46 (52.3%) males and 42 (47.7%) females, with a mean age of 42.2 ± 8.7 SD years and a mean year of practice of 8.8 ± 6.7 SD.

They were mainly consultants 45 (51.1%), who practiced as comprehensive ophthalmologists, 63 (71.6%) in government hospitals and 57 (64.8%) located at the southern part of Nigeria. Details of the demographic and practice characteristics of participants are given in Table 1. The distribution of

Table 1 Demographic and practice characteristics of participants. $N = 88$

Characteristics	*N* (%)	Mean
Age (years)		
≤ 45	58 (65.9)	42.18 ± 8.72
> 45	30 (34.1)	
Gender		
Male	46 (52.3)	
Female	42 (47.7)	
Cadre		
Consultant	45 (51.1)	
Resident	31 (35.2)	
Diplomate	12 (13.6)	
Years of practice		
≤ 10	65 (73.9)	8.82 ± 6.72
> 10	23 (26.1)	
Pattern of practice		
Comprehensive	63 (71.6)	
Subspecialty	2 (2.3)	
Both	23 (26.1)	
Hospital type		
Government	57 (64.8)	
Private	2 (2.3)	
Both	29 (33.0)	

subspecialties and location of practice are shown in Figs. 1 and 2, respectively.

Glaucoma diagnosis

The majority of the participants 57 (64.8%) were diagnosed glaucoma properly.

Optic disc assessment was mainly indirect with 90D lens, 48 (54.5%), and direct ophthalmoscopy, 33 (37.5%). Optical coherence tomography (OCT), 5 (5.7%), and fundus photography, 2 (2.3%), were also used.

Tonometry was performed as follows: Goldmann Applanation tonometer, 58 (65.9%), non-contact tonometer, 33 (37.5), and I-Care tonometer, 2 (2.3%). Only 8 (9.1%) still used Schiotz.

Perimetry was mainly with standard automated perimetry (SAP) (Humphrey), 68 (77.3%), and frequency doubling test (FDT), 16 (18.2%). Others were short-wavelength automated perimetry (SWAP) and manual kinetic perimeter.

Angle assessment was mainly by gonioscopy, 57 (64.8%).

The mean number of glaucoma patients seen on monthly basis was as follows: adults 45.3 ± 4.1, paediatrics 8.64 ± 12.3, new adults 15.4 ± 17.8 and new paediatrics 3.03 ± 4.4.

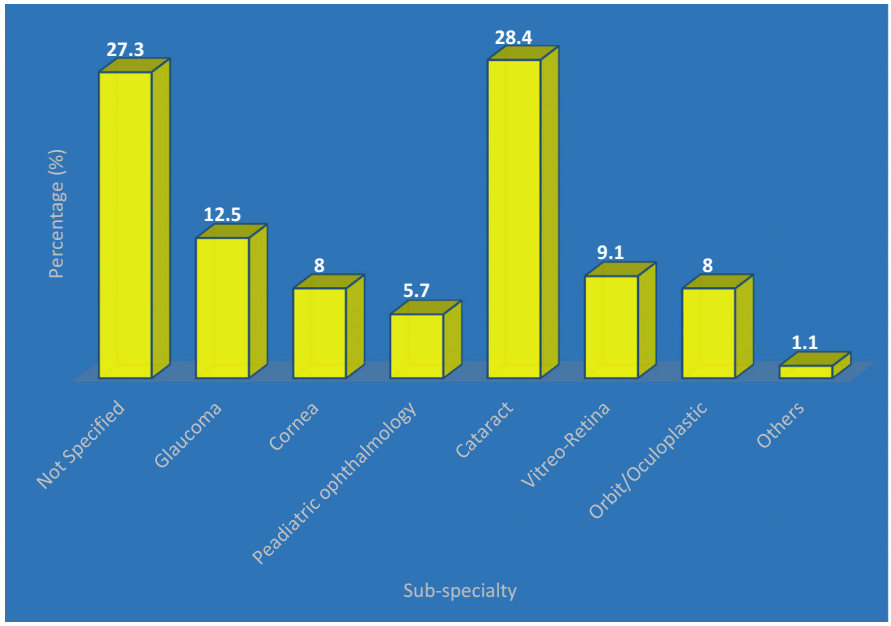

Fig. 1 Percentage distribution of respondents according to subspecialty

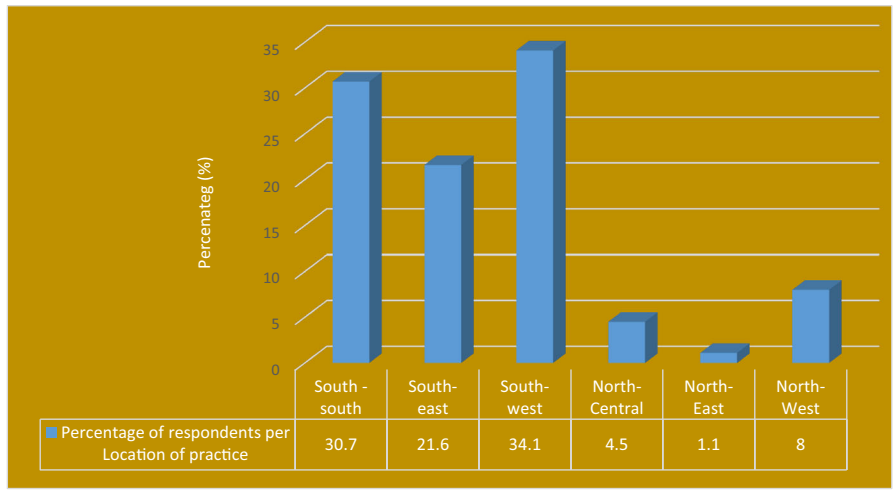

Fig. 2 Percentage distribution of respondents based on location of practice

Glaucoma treatment

Sixty-three (71.6%) participants underwent trabeculectomy, 48 (54.5%) combined cataract surgery with trabeculectomy, 7 (8.0%) drainage implants, 5 (5.7%) laser trabeculoplasty (LTP), 8 (9.1%) laser peripheral iridotomy (LPI), and 2 (2.3%) minimally invasive glaucoma surgery (MIGS).

The mean number of trabeculectomies done in a month was 2.25 ± 3.8. The percentage distribution of the number of trabeculectomies done in a month is shown in Fig. 3.

Being less than or 45 years of age, being a diplomate, working in a government hospital and making proper glaucoma diagnosis were predictive of performing trabeculectomy, as given in Table 2.

Challenges with glaucoma care

The major challenges with diagnosis were lack of functional equipment, cost and lack of expertise in early glaucoma diagnosis. The challenges with trabeculectomy were mainly low acceptance and satisfaction, fear of complications, lengthy post-operative care and cost.

The participants observed poor patients' compliance with medical therapy. The majority addressed it with proper education and counselling, modification of medications, cost reduction and laser therapy. However, 9 (10.3%) participants addressed it with trabeculectomy.

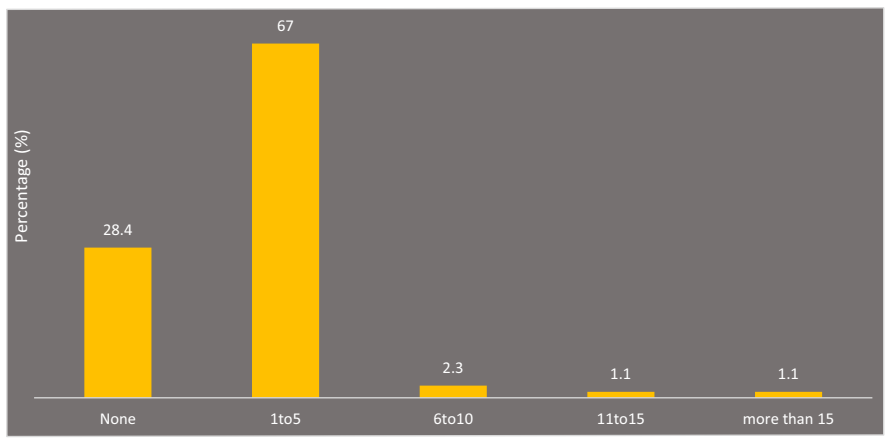

Fig. 3 Percentage distribution of number of trabeculectomies done per month (mean = 2.25)

Table 2 Factors predictive of the number of trabeculectomies performed

Variables	*N* (88)	Trabeculectomy		*F* value/*T* value	*P* value
		Mean	SD		
Age					
≤ 45	58	2.80	3.92		
> 45	30	1.08	1.10	4.42	0.039*
Gender					
Male	46	2.43	3.96	0.203	0.654
Female	42	2.08	2.73		
Years of practice					
≤ 10	65	2.61	3.79	4.47	0.121
> 10	23	1.21	1.22		
Cadre					
Consultant	45	2.05	3.90		
Residents	31	1.50	1.11	3.94	0.024*
Diplomate	12	4.73	4.10		
Pattern of practice					
Comprehensive	63	1.95	2.43		
Subspecialty/both	25	3.16	5.26	1.84	0.179
Subspecialty					
Glaucoma	11	1.17	0.753		
Others	77	2.35	3.506	0.670	0.416
Location of practice					
South	76	2.21	3.541		
North	12	2.56	1.944	0.081	0.77
Hospital type					
Government	57	2.96	4.145	5.122	0.027*
Private/both	31	1.20	1.095		
Glaucoma diagnosis					
Proper	57	2.80	3.919	4.420	0.039*
Others	31	1.08	1.139		

*Statistically significant

Recommendations

On improving glaucoma care in Nigeria, the majority recommended training of subspecialists, provision of equipment, availability of cheaper medications, universal health insurance and strengthening primary and secondary eye health centres, as well as public awareness, advocacy and research.

Discussion

Based on the findings from a similar survey [10] conducted almost a decade ago, there has been significant improvement on glaucoma care. More glaucoma patients were attended to with newer techniques for diagnosis and therapy as documented in the present study. For instance, there was less dependence on the use of direct ophthalmoscope, Schiotz is almost non-existent 33–9%, and more ophthalmologists performed trabeculectomy 48–67%. Combined surgeries, laser therapy and minimally invasive glaucoma surgeries (MIGS) were observed to be in current practice, as well as early glaucoma detection with frequency doubling technique (FDT) and optical coherence tomography (OCT). The impact on the Nigerian situation of the ongoing fellowship training sponsored by the International Council of Ophthalmology (ICO), the

Commonwealth Eye Health Consortium (CEHC) and other self-sponsored programs may explain this observation.

However, challenges with trabeculectomy, poor patients' acceptance and satisfaction, fear of complications, lengthy post-operative care and cost have remained the same.

In this study, being less than or 45 years of age, being a diplomate, working in a government hospital and making proper glaucoma diagnosis were predictive of performing trabeculectomy. The fact that the diplomate training in Nigeria was designed to expose the trainees to surgical skill acquisition at high surgical volume centres for extended periods may explain this finding. This extended surgical exposure builds up self-confidence and expertise needed to perform trabeculectomy without fear of complications. Therefore, glaucoma surgical skill acquisition should be more emphasized in the current residency curriculum. However, the need for training of young ophthalmologists as glaucoma subspecialists, provision of equipment, availability of cheaper medications, universal health insurance and strengthening primary and secondary eye health centres, as well as public awareness, advocacy and research, to improve on glaucoma care in Nigeria cannot be over-emphasized.

The interpretation of results in this work may be limited by the low number of participants among the ophthalmologists in Nigeria, estimated at 250.

Conclusion

Given the meagre number of specialists and lack of strict subspecialty practice, despite the observed improvement in diagnosis and treatment, optimal glaucoma care in Nigeria is still far from reality. These data could serve to inform policy makers on resource allocation and guideline for glaucoma care adapted to the Nigerian environment.

Compliance with ethical standards

Conflict of interest The authors declare no real or potential competing interests in this work.

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