Improving services for glaucoma care in Nigeria: implications for policy and programmes to achieve universal health coverage

Fatima Kyari,[1,2] Clare Gilbert,[1] Karl Blanchet,[3] Richard Wormald[1,4]

[1]Department of Clinical Research, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, London, UK
[2]Baze University, Abuja, Nigeria
[3]Department of Global Health and Development, Health in Humanitarian Crisis Centre, London School of Hygiene and Tropical Medicine, London, UK
[4]Department of Ophthalmology, Moorfields Eye Hospital, London, UK

Correspondence to
Dr Fatima Kyari, Department of Clinical Research, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK; Fatima.Kyari@lshtm.ac.uk, fatimaygk@gmail.com

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ABSTRACT

Glaucoma in Africa is sometimes referred to as the silent thief of sight. In Nigeria, glaucoma is common, it is serious, ophthalmologists face many constraints in managing it, people do not even know they have it until it is advanced, patients do not understand or comply with treatment after they are diagnosed and the poor are more likely to be glaucoma blind. Available evidence indicates that the health system in Nigeria is failing to meet the needs of patients with glaucoma. Based on evidence, we propose future directions for improving services for glaucoma care in Nigeria, and the implications for policy and programmes to control glaucoma blindness, using a health system-oriented approach. Three complementary strategies are required: (i) strengthening clinical services for glaucoma—by developing models of glaucoma care, improving clinical treatment options, making medicines and equipment available, financing glaucoma care and training eye care workers; (ii) introducing initiatives for earlier detection of glaucoma in the clinic and approaches in the community and (iii) strengthening health system governance. Glaucoma is a complex disease to manage and addressing it as a public health problem is challenging. However, we need to change the paradigm to recognise that glaucoma is a potentially avoidable cause of blindness in Africa.

INTRODUCTION

The United Nations resolution on Universal Health Coverage (UHC) is fundamental to achieving sustainable development goal no. 3—equity in health for everyone. This entails improving access to quality health services and protection against financial risks in accessing services.[1] In line with UHC, a Global Action Plan 2014–2019 was developed for eye care,[2] which aims to ensure that eye diseases that cause blindness and visual impairment are addressed through universal standards of eye care that address local priorities.

Glaucoma is a group of eye diseases characterised by progressive optic neuropathy with visual field loss which can lead to irreversible blindness. Glaucoma affected more than 64.3 million globally in 2013, and is projected to increase to 76 million by 2020.[3] Primary open angle glaucoma is the most common type, affecting 57.5 million people in 2015, increasing to 65.5 million by 2020.[4]

Glaucoma in Africa is sometimes referred to as the *silent thief of sight*,[5] and available evidence indicates that the health system in Nigeria is failing to meet the needs of patients with glaucoma. Based on our findings[6–10] (summarised in figure 1), we propose future directions for improving services for glaucoma care in Nigeria, and the implications for policy and programmes to control glaucoma blindness, using a health system-oriented approach. Some of our recommendations also derive from major meetings on glaucoma in Africa: The Africa Glaucoma Summit in Accra, Ghana (2010)[11] and the Public Health Control of Vision Loss from Glaucoma in Africa Workshop in Kampala, Uganda (2012)[12] as well as relevant publications.[13 14] The strategy we recommend is to target those in greatest need for glaucoma care to prevent them from going blind, supported by policies and funding mechanisms for service delivery, and clinical and operational research. At the same time, there is a need for health partnerships and social policies to address poverty through improved education and literacy, entrepreneurship and wealth creation.

GLAUCOMA IN NIGERIA

Data from the 2009 Nigeria national blindness and visual impairment survey (thereafter referred to as the Nigeria Blindness Survey) indicated that 4.2% of adults aged 40 years and above were blind.[15] Glaucoma was the second most common cause of blindness (16.7%),[16] principally open angle glaucoma (OAG) (86% of all glaucoma).[6] In 2009, 5% of survey participants had glaucoma, affecting an estimated 1.8 million adults, and one in five was blind that is, had a presenting visual acuity (VA) of <3/60 in the better eye. Ninety-four per cent were not diagnosed and not receiving care.[6] Independent risk factors for OAG were higher intraocular pressure, increasing age and Igbo ethnicity.[7] People of low socioeconomic status were approximately four times more likely to be blind from glaucoma,[8] reflecting limited awareness of glaucoma and poor access to care. Additionally, ophthalmologists face many constraints in managing it.[9]

From the Nigeria Blindness Survey, it is estimated that per million population, 10 500 adults (aged 40 years and above) have glaucoma. The following definitions were used to estimate the number affected by level of severity, using the most affected eye: severe/advanced glaucoma—VA <3/60, vertical cup:disc ratio (VCDR) >0.8 and central visual field (CVF) of <10°; moderate glaucoma—any level of VA with VCDR >0.7 and CVF of 10–20°; early/mild glaucoma—any glaucomatous visual field defect and VCDR ≥0.7. Blind/end-stage glaucoma was defined as VA <3/60 in the better eye with a VCDR of 1.0.[17] There are estimated to be 5900 (56%) adults per million population with severe/advanced disease, often blind in one eye and/or

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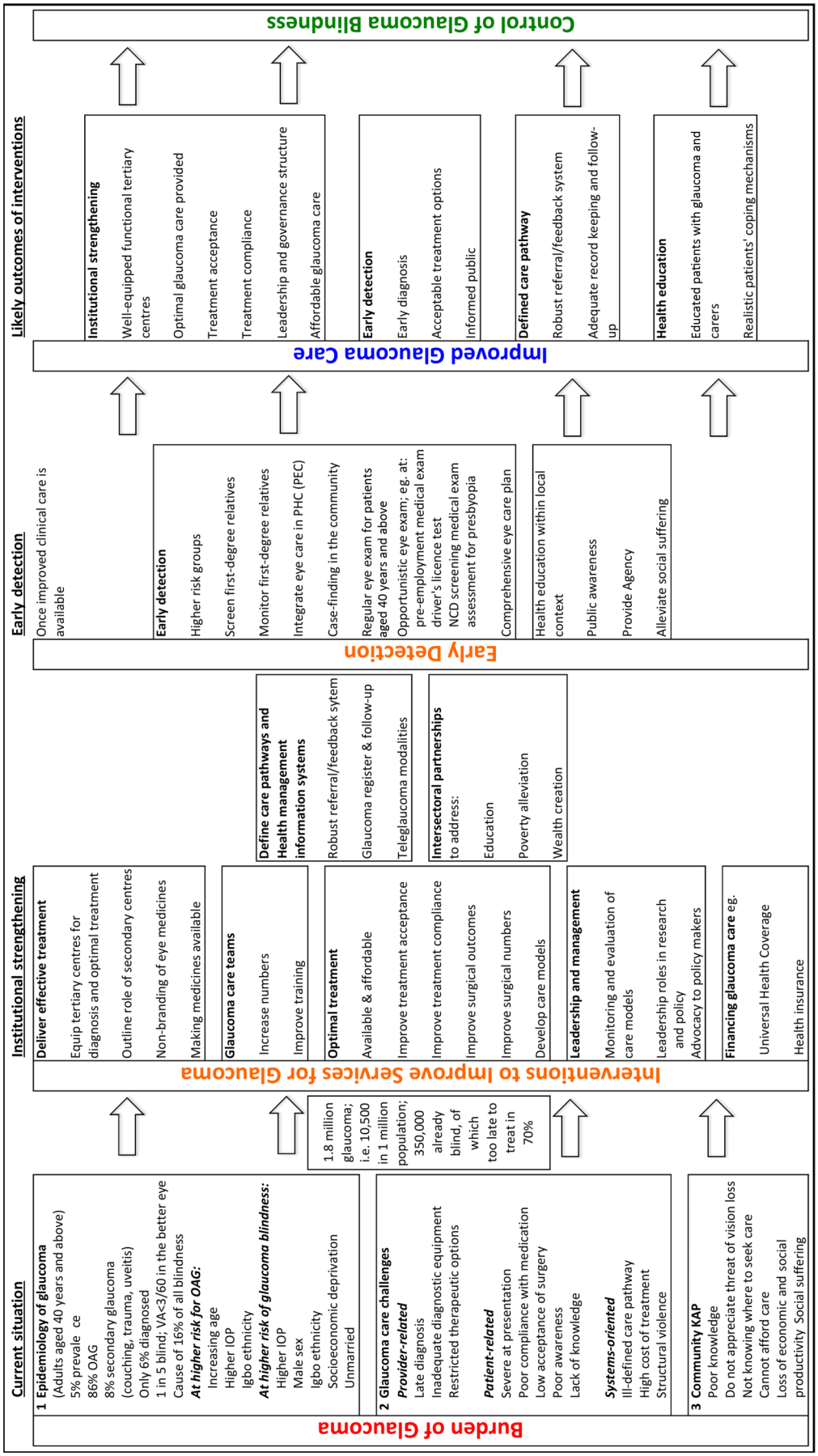

Figure 1 Conceptual framework for improving services for glaucoma in Nigeria.

with severe visual impairment in the other eye, 2100 (20%) moderate cases, 400 (4%) early cases and a further 2100 (20%) are blind in both eyes.

Several factors contribute to the high prevalence of glaucoma blindness in Nigeria. These include low rates of early detection and diagnosis,[17] lack of specialist equipment and treatment options, lack of specialist glaucoma clinics and care pathways, poor compliance with treatment and follow-up,[9] the high cost of accessing care and treatment costs[18] and lack of awareness and public knowledge about glaucoma compounded by socioeconomic deprivation.[10] The number of eye health workers in Nigeria, including ophthalmologists and optometrists, falls short of WHO recommendations.[19 20] In addition, Nigeria does not have an eye health policy and the national strategic plan for eye care is not uniformly implemented.

Considering these factors, three complementary strategies need to be put in place to reduce glaucoma blindness: (i) strengthening clinical services for glaucoma; (ii) introducing initiatives for earlier detection of glaucoma and (iii) strengthening health system governance.

STRENGTHENING CLINICAL SERVICES FOR GLAUCOMA

Developing models of glaucoma care

There are currently no published articles on models of glaucoma care in Africa. A conceptual framework and systems approach for improving services for glaucoma in Nigeria are shown in figure 1. Clinical, operational and health system research need to be embedded in care delivery models to determine optimal ways to improve access and acceptance of cost-effective treatment, to improve patients' hospital experiences and compliance rates, to promote follow-up of patients with stable disease in district eye departments and for the earlier detection of glaucoma in the community.

Improving clinical treatment options

The treatment recommended for glaucoma in Africa depends on several factors. Medical therapy is often the first-line of treatment, with β-blockers and prostaglandin analogues (PGAs) being available to prescribe by at least 97% of ophthalmologists in Nigeria.[9] PGAs are effective in preventing progression of visual field loss in the UK population,[21] but their use in Nigeria is limited due to their high cost. Other constraints include poor compliance with medicines and uncertain potency of topical preparations, which are usually kept in high ambient temperatures. One-off interventions are recommended in Africa, one being primary trabeculectomy with antimetabolites or β-irradiation, with a suggested 'glaucoma surgical rate' of 800 glaucoma surgeries per million population per year.[22] Indeed, skilful trabeculectomy with a joint care plan and adequate follow-up may be a good option but acceptance of surgery can be very low.[9 17] Laser therapy seems a safe and acceptable alternative, which reduces costs to patients, as an inpatient stay is not required. Although the initial capital outlay for lasers is high, they can be used to treat other eye conditions, and can function for many years. An effective, safe, affordable and acceptable one-off treatment is the first essential building block of glaucoma care in Africa, particularly for the poor and illiterate and those who live far from eye care facilities. Treatment modalities need to be assessed in randomised controlled trials to determine the most cost-effective and acceptable treatment for patients and providers in the African context.

Making medicines, surgery and laser treatment available

To improve access to treatment, institutions need to be strengthened with equipment and training in surgical skills and laser procedures, with the development of glaucoma care teams. Tertiary institutions should have specialist glaucoma clinics that are adequately resourced so that a full assessment and definitive diagnosis can be made at the first visit, with counselling of patients and their carers about treatment and the need for long-term follow-up.

Relevant government ministries/agencies are urged to improve the supply chain of glaucoma medications and surgical consumables through tax and import duty waivers, and by providing an enabling environment for local production of glaucoma medication. Pharmaceutical companies could be called on to provide non-branded PGAs which may be made affordable and provided free of charge to the poorest through government's UHC mechanisms, and global technology partners should make lasers and accessories (lenses, probes, protective goggles, etc) more affordable for service providers in low-income and middle-income countries.

Financing glaucoma care

No patient should receive suboptimal care because he or she cannot afford treatment. Strategies for healthcare financing for glaucoma to contain costs need to be developed and evaluated. One approach could be to provide free treatment to poor patients. Another is to advocate that more potent medications such as PGAs, and trabeculectomy and laser procedures be covered by health insurance. UHC through government budgetary allocations is probably the most sustainable approach for such a chronic, serious and lifelong disease.

Human resources for eye health

In order to improve services for glaucoma, multitasking by health workers is recommended with, for example, nurses being trained to perform optic nerve head photography and visual field analysis. Early detection of significant glaucoma through community-based opportunistic case detection by optometrists, follow-up in the community and community-based care especially for postoperative cases by ophthalmic nurses and testing for vision loss by primary healthcare workers are also strategies to explore. Agreement on professional boundaries will be required, with clearly defined work areas for allied eye care members of the glaucoma care team, and clearly defined roles for glaucoma care in secondary centres.[23]

Health information system

Health management information systems are essential for improving glaucoma services in Nigeria to provide good medical records systems to track patients over time and monitor trends of treatment. We recommend that the number of procedures for glaucoma, as well as the number of cataract operations, should be monitored and reported centrally. Good medical records are also important for robust referral/feedback systems, to document clinical findings for follow-up and to develop a database of patients with glaucoma.

APPROACHES FOR EARLIER DETECTION OF GLAUCOMA

Before starting any intervention for case detection, adequate clinical services for glaucoma must be in place. The challenge of a public health glaucoma care programme would be to find people who already have significant glaucoma and ensure they have access to services to reduce the risk of progression to

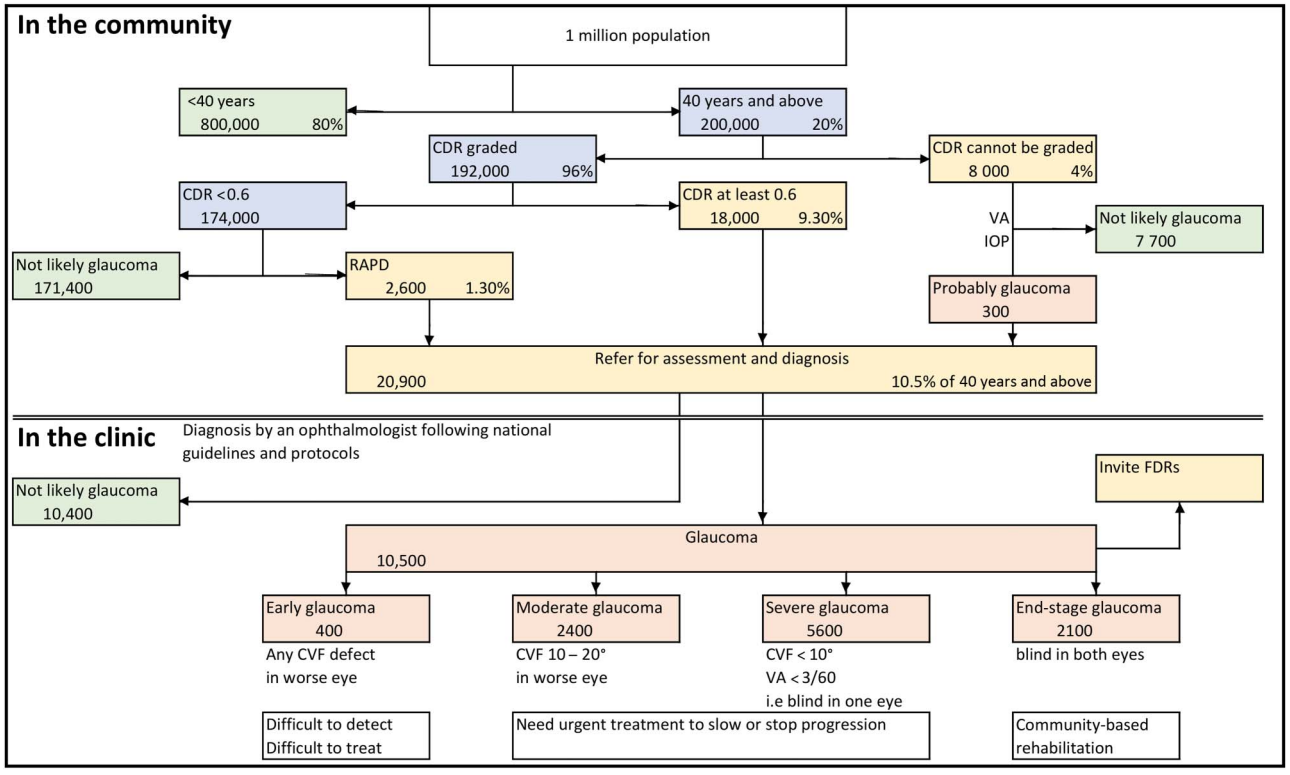

Figure 2 Algorithm for glaucoma case detection at community and clinic levels by assessment of cup:disc ratio and relative afferent pupillary defect.

bilateral blindness. The poorest in the population need to be targeted because glaucoma blindness affects them the most.

In the clinic

Primary eye care, including that provided by optometrists who are few in number and usually located in urban areas, is almost entirely lacking in Nigeria, as in many countries in Africa, and so there are no mechanisms for early detection of glaucoma. One solution to improve earlier detection of glaucoma is to ensure that all adults aged 40 years and above who present to eye care services, regardless of their presenting complaint, undergo routine optic disc assessment. This approach was effective in the eye department in Bauchi, North-Eastern Nigeria, where the optometrists referred anyone with a CDR ≥0.6 to the ophthalmologist for examination.[17]

Identified high-risk groups and first-degree relatives of patients with glaucoma should also be targeted.

Community approaches

We advocate that optic disc assessment of all those aged 40 years and above become an integral component of outreach eye care activities with a referral of those with VCDR ≥0.6 to designated facilities for full assessment, definitive diagnosis and treatment. Another assessment to consider at the community level is a properly conducted swinging flashlight test to detect relative afferent pupillary defects, which has the potential to find at least 25% of glaucoma,[24] and with strong specificity for glaucoma.[25]

Figure 2 shows a possible algorithm for glaucoma case detection at community and clinic levels. In a retrospective evaluation of outreach in Ibadan, people referred from outreach were twice as likely to have mild/moderate glaucoma than patients referred from other facilities who had more severe disease.[26]

Another strategy is to integrate optic disc imaging using mobile phone apps into screening activities for non-communicable diseases, or into programmes for the control of onchocerciasis (river blindness) and trachoma, which are reaching a high proportion of the most vulnerable population in Nigeria.

Informal providers of healthcare, who are ubiquitous and acceptable to community members in Africa, could also be engaged in identifying individuals suspected of having glaucoma. For example, in Nassarawa, spectacle vendors were enrolled in a study to assess interventions for finding cases of glaucoma in the community. About half of those referred by spectacle vendors subsequently attended the eye clinic, 15% of whom were newly diagnosed with glaucoma (personal communication: HI, MSc PHEC dissertation, LSHTM 2016).

Other approaches for earlier detection may include designing and implementing a community awareness strategy, using local terms such as those in Hausa that describe behaviour associated with peripheral visual field loss (eg, *taka shanya*), through social and mass media platforms such as radio which has a wide reach, television and newspapers. For example, people could be encouraged to regularly check the vision of each eye by covering the other eye. Community awareness strategies should be planned carefully to avoid creating a demand that cannot be met. However, greater demand is needed to generate political pressure that may drive the development of better services.

STRENGTHENING HEALTH SYSTEM GOVERNANCE

A strong health system requires leadership and governance to deliver improved care, based on evidence of what works, as day-to-day monitoring and interval evaluation can improve services. Additionally, it is important that team leaders take part in developing policies to include glaucoma in national healthcare

plans and to integrate eye care into programmes for non-communicable diseases. Data and information are also required for advocacy with policy makers and for the engagement of civil society to improve health education, knowledge and public awareness.

The associations of patients with glaucoma can be strengthened to support vulnerable groups through sharing experiences and resources by patients and family advocates.

CONCLUSION

Glaucoma is a complex disease to manage and addressing it as a public health problem is a challenge. However, we need to change the paradigm to recognise that glaucoma is a potentially avoidable cause of blindness in Africa. We have discussed possible ways in which to improve services for glaucoma in Nigeria with the aim of ensuring inclusion of those most at risk of blindness from glaucoma that is, the poor. Further clinical and operational research is required to address the acknowledged evidence gaps. We also advocate for policies to make glaucoma treatment available and affordable to all, and possibly free to the poor. Rather than remaining silent, let us give patients with glaucoma a voice so that the silent thief of sight does not lead them into darkness.

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Notes