

Meeting the Challenge of Glaucoma in Africa

Innovative strategies and increased investment are required to improve the diagnosis and treatment of glaucoma.

BY SCOTT D. LAWRENCE, MD, AND DONALD L. BUDENZ, MD, MPH



In this edition of Glaucoma Today's "International Perspectives" column, Scott D. Lawrence, MD, and Donald L. Budenz, MD, MPH, identify issues that differentiate Sub-Saharan Africa (SSA) from other less developed nations in relation to glaucoma care. This region

of Africa has one of the lowest numbers of ophthalmologists per capita globally and has a higher prevalence and severity of glaucoma than other developing countries. Drs. Lawrence and Budenz point out the need for innovative screening strategies and novel therapeutic concepts.

An introductory course in a school of public health would ask students the following question: How would you spend \$1 million on health care in SSA? Unlike other developing nations, far more eye diseases are competing for each dollar. Most countries in SSA are not only concerned with cataract blindness but must address other diseases such as trachoma and river blindness as well. Add to that the cost of expensive therapies for systemic diseases such as malnutrition, malaria, and AIDS. Taking all of this into account, it is hard to imagine how to balance the million-dollar budget.

Self-sufficiency is the cornerstone of long-term success. The development of centers of excellence within SSA, whereby ophthalmologists train others for subspecialty care, is crucial. A matter that will need to be addressed is how and where to develop an initial center of excellence in SSA.

I hope you enjoy this edition of "International Perspectives" and that this and the articles that follow broaden your perspective on glaucoma care around the world.

—Alan L. Robin, MD, section editor

Glaucoma in SSA is a devastating and often neglected disease. Now the second leading cause of blindness in Africa after cataract, glaucoma is responsible for approximately 15% of blindness on the continent.¹ Despite having the highest incidence and prevalence of glaucoma in the world, the African region has only recently

recognized glaucoma as a priority eye disease, according to Vision 2020 initiatives. This discrepancy likely reflects a widespread perception both within and outside Africa that the challenges of diagnosing and treating glaucoma in this context are insurmountable. The World Glaucoma Association's inaugural African Glaucoma Summit in Ghana in 2010, however, may have signaled a momentous shift toward collaborative and innovative efforts aimed at addressing these challenges. The meeting gathered 222 participants from 27 African countries as well as international glaucoma experts and representatives from the nongovernmental organization (NGO) and industry sectors.

GLAUCOMA AS A PUBLIC HEALTH PROBLEM

Clinical experience and population-based research suggest that glaucoma affects Africans on a scale unparalleled in most of the world. Numerous studies in different countries within SSA have demonstrated a significantly higher prevalence of glaucoma. The recent Tema Eye Survey in Ghana found an overall prevalence of primary open-angle glaucoma in people over age 40 of 6.8% that increased to 14.6% among those 80 years and older.² Compounding the public health impact is that, in Africa, unlike other areas of the developing world, glaucoma tends to take an aggressive course with a higher IOP and an earlier age of onset, visual disability, and blindness. In some African populations, glaucoma is responsible for up to 30% of blindness,³ and patients' presentation is typically late, with up to 50% of them blind in one eye at the time of diagnosis. As has been documented in other areas of the developing world, approximately 90% of African patients with glaucoma are unaware that they have the disease.

Public health initiatives targeting glaucoma in SSA must address factors underlying a lack of public awareness of glaucoma. One problem is that 80% or more of the population lives in rural areas, while the majority of ophthalmologists reside in urban centers. Although community-based



Figure. Glaucoma screening in Tema, Ghana, being performed with frequency-doubling technology (Carl Zeiss Meditec, Inc.) as well as an Early Treatment Diabetic Retinopathy Study (ETDRS) tumbling “E” chart, handheld applanation tonometry, and a handheld fundus camera (not shown).

screening is not generally recommended, case detection can be improved by screening individuals with known glaucoma risk factors, including age and family history. Education will continue to be an essential component of any public health strategy to raise glaucoma awareness, and a multifaceted approach using literature, media, and institutions is needed. Telemedicine is another strategy for increasing rural populations’ access to care. Having demonstrated early positive results in other developing countries like India, this approach is beginning to gain acceptance in the African community as well.

OPERATING WITH LIMITED RESOURCES

In many regions of SSA, there is only one ophthalmologist per 1 million people. The shortage of trained eye care providers is matched by a limited number of eye hospitals, the majority of which are located in urban centers. Institutional capacity is further limited by the significant costs associated with procuring and maintaining glaucoma diagnostic equipment such as automated perimeters and fundus cameras. Diagnosing and monitoring patients for glaucomatous progression may be unrealistic in some African contexts. In areas with extremely restricted access to care, efforts will likely need to focus on treating patients with advanced disease that can be diagnosed through tonometry and optic disc examination without the need for visual field testing (Figure).

The limited number of ophthalmologists and glaucoma specialists in Africa reflects the relatively few institutions

and programs for training them in the region. Providing clinical and surgical training opportunities for African ophthalmologists, including international (“sandwich”) fellowships, is a valuable means of equipping the African eye care community. In this model, a subspecialist mentor from a developed country travels to the developing country to work with a candidate who is being groomed for subspecialty care. The candidate then comes to the mentor’s home country to observe the mentor for a few months. The mentor returns to the candidate’s country to supervise him or her during surgery and throughout patients’ postoperative care. The mentor and trainee make additional trips as needed. As the number of ophthalmologists with glaucoma training increases, this model can be replicated within Africa as well. A more practical approach, however, would be to establish new centers of excellence throughout Africa that could facilitate not only the delivery of eye care but also ophthalmology and glaucoma subspecialty training, clinical research, and public health initiatives.

SEARCHING FOR THE IDEAL TREATMENT

Medical management is rarely successful in SSA due to its cost and the difficulty of obtaining medications, leading to poor compliance. Only a small percentage of patients treated medically achieve a therapeutic IOP goal.⁴ Numerous hurdles exist for surgical approaches as well. In Africa, patients’ expectations for glaucoma surgery are heavily influenced by cataract surgical outcomes, which have a higher public profile. The false perception that glaucoma surgery can improve vision similarly to cataract surgery certainly exists in the developed world, but this gap in understanding is significantly greater in Africa, where advanced disease and visual disability can blur the distinction between cataract blindness and glaucoma blindness.

Despite interest in alternative surgical options for African patients with advanced glaucoma, trabeculectomy with mitomycin C remains the best surgical approach. The availability of inexpensive glaucoma drainage tube implants may provide another primary surgical option, but further outcomes studies in this population are required. Laser trabeculoplasty may play an adjunctive role in treatment, and a recent study in an African-derived population showed a 30% reduction in IOP 1 year postoperatively.⁵ Despite an excellent safety profile, glaucoma laser therapy is costly and may have limited use in advanced glaucoma cases where a very low IOP of long duration is required. Transscleral cyclophotocoagulation has been studied as a primary treatment alternative to medical therapy in Africa. The procedure does not typically lower IOP into the normal range, however, and patients need retreatment and oftentimes cataract surgery when

this approach is used.⁶ There is a need for further research into medical and surgical treatments that have the potential for sustained IOP lowering in African patients. As methods to detect glaucoma improve, there may be an increased demand for combined cataract and glaucoma surgery in the future.

COMPETING EYE DISEASES

Despite being a major cause of blindness in Africa, glaucoma has received only limited attention and resources from blindness-prevention NGOs. Other eye diseases such as cataracts, vitamin A deficiency, childhood refractive error, and trachoma have proven treatments that have been supported by significant NGO investment. Moreover, advances in treating cataract blindness have been augmented by effective screening programs, low-cost supplies, and high-volume surgical approaches, leading many NGOs to make cataract intervention a primary target.

A growing trend away from disease-targeted programs toward more synergistic approaches could lead to increased glaucoma interventions. In particular, glaucoma, cataracts, and diabetic retinopathy are all major causes of visual impairment in Africa and affect older age groups. In addition to more comprehensive screening programs, preoperative examinations for cataract surgery provide a valuable opportunity for the detection of glaucoma as well. If a synergistic approach to eye care in Africa can be matched by international collaboration involving academic leaders, industry, and NGOs, there is hope of progress in addressing glaucoma blindness in the African population in the years ahead. ■

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