Childhood Visual Impairment and Unmet Low-vision Care in Blind School Students in Ghana

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Abstract

Most causes of childhood blindness in Ghana are avoidable. Over 40 % of the students in the school for the blind in Ghana have functional residual vision that requires low-vision care. Corneal blindness is the commonest form, followed by cataract. Retinal blindness is rare and is usually from hereditary or congenital causes. The Expanded Program of Immunization (EPI) in the Ghana health service has been very successful, with measles coverage for under one-year-olds of 95 %. This should now translate into a decline in measles-related corneal blindness, a common preventable occurrence. This then brings challenges in cataract management into focus. Provision of sustainable intervention services for low-vision care in children is a priority for the Prevention of Childhood Blindness program in Ghana. Barriers to access range from parents' negative perceptions, societal/cultural misconceptions, and inadequate resources, to absence of collaboration and coordination between low-vision care providers and weak national support. Clients usually come from families within the lower socioeconomic groups and often find the low-vision devices unaffordable. A successful program for intervention is more likely to succeed when it is subsidized, at least until a reasonable impact has been made. One must, however, strike a good balance between cost recovery, which is more likely to ensure sustainability of the program, and subsidization.

Keywords

Low vision, blindness, congenital cataract, corneal blindness, herbal medicine

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Ghana lies in the center of the West African coast, bordered on the south by the Gulf of Guinea and the Atlantic Ocean, between Ivory Coast to the west and Togo to the east. Its southernmost point is Cape Three Points, 4° 30' N of the equator, from where it extends inland to latitude 11° N and extends between longitudes 1° E and 3° W, with the Greenwich Meridian passing through the capital, Accra. Overall, it covers an area of 238,533 square kilometers. The population is about 24 million. Children (under 16 years of age) form about 40 % of the population. Eye care is currently provided by 50 ophthalmologists (including one specialist in low vision), 67 optometrists, 295 ophthalmic nurses, and some primary healthcare workers. There is also variable collaboration between the Ghana Health Service and the Ghana Education Service in school eye health programs, including rehabilitation of students with low vision and blindness. In addition, some organizations play an active role in blindness prevention programs, notably WHO, Sightsavers, and Lions Clubs International. Our eye care system has its fair share of challenges experienced in developing countries. Since Vision 2020 was launched in Ghana in October 1999, Ghana has been further challenged to realize the goals of prevention of childhood blindness and provision of low-vision care. Most causes of childhood blindness in the country are avoidable.[1]

In June 2002, WHO launched the five-year childhood blindness prevention project. Centers for children's eye care and low-vision care were established in 30 countries, including Ghana. Korle Bu Teaching Hospital is the center of the project covering the Greater Accra and Eastern regions of the country with a population of 5,200,000. The project area has one school for the blind that mainly caters for the southern parts of the country. The main partner is Sightsavers International that supports eye care, including low-vision care, in the Eastern and Volta regions. The National Eye Care Program had a low-vision care program, which was once supported by the Christian Blind Mission before the WHO/Lions center was established. The Society for the Blind and the sector for social welfare also carry out some low-vision care.

Personal communication with ophthalmologists in West and East Africa and some studies indicate that corneal opacities have been the commonest cause of blindness in sub-Saharan Africa.[2] In students of the Akropong School for the Blind in Ghana, visual impairment was noticed in the first year of life in 53 % of students and at the age of 1–5 years in 18 %, 6–10 years in 18 %, and 11–15 years in 11 %.[3] Corneal blindness commonly occurred in the first year of life in 45 % (43/96) of the

students and correlated well with the major risk factors of measles and ocular instillation of traditional medicine. Vitamin A deficiency is a problem in the northern part of Ghana but not the south. Primary healthcare approaches, such as measles vaccination and vitamin A supplementation, that can reduce childhood blindness, are delivered as part of the Expanded Program of Immunization (EPI) in the Ghana Health Service nationwide and have been very successful, measles coverage for under one-year-olds being 95 % and vitamin A supplementation coverage rate for six- to 59-month-olds being 77 % for full coverage and 95 % for at least one dose.[4] This should now translate into a decline in measles-related corneal blindness. Cataract is next in order of importance, and this is also a reflection of unsatisfactory results of the management of childhood cataract that is contributing a proportion of 24 % of visual impairment. Cataract-related visual impairment is a major issue even within the catchment area of the WHO-designated childhood blindness project in the Korle Bu Teaching Hospital. Congenital cataracts usually present late to the ophthalmologist and this is further compounded by problems with treating aphakia and amblyopia and poor post-operative follow-up culture. Traditional medicine is often tried when post-operative results are unsatisfactory. In Ghana retinal lesions are low on the list, contributing a proportion of 17 % of visual impairment in the 0–15 year group, and usually tend to be hereditary or congenital. In the developed nations retinal pathology tends to be the commonest cause of low vision.

Low vision is defined as vision of 6/18 or 20/60 to perception of light, not improved by medical, surgical, or spectacle correction in the better eye, or a visual field of less than 10° from the point of fixation, but where the patient uses or has the potential to use vision for the planning and/or execution of a task. In studies, functional vision or useful residual vision is determined by the ability to perform the following using the WHO/Prevention of Blindness (PBL) eye examination record for children with blindness and low vision:[5]

1. test of independent mobility (ability to navigate without assistance between chairs set two meters apart in a well-lit room);

2. test of social contact (ability to recognize someone known to them at a distance of 10 feet);

3. test of near vision (ability to recognize the shape of three 2 cm symbols at any near distance equivalent to N-60); and

4. believed to have useful residual vision (defined as sufficient vision for at least independent mobility, making social contacts, or near vision, if formal testing of visual acuity is not possible).

Over 40 % of students at the School for the Blind had functional residual vision and indeed two students were able to read N5 and N8 prints with the spectacle magnifier, the only low-vision device that was available at the time of the study.[3] This is an indication of unmet low-vision care. The prevalence of functional low vision (FLV) in a study carried out in India, South Africa, and Latin America ranged from 0.65 to 2.75 in 1,000 children, with wide confidence intervals.[6] There is no such study in Ghana for comparison, but it is likely that the prevalence lies in the upper half of this range.

Low-vision rehabilitation comprises providing the patient with assistive devices and training to improve the quality of life. In most of the developing world many children in schools for the blind receive formal education using Braille. Sloan et al. showed 40 years ago that children, compared with adults, have a very high rate of successful low-vision device use, when aids are properly prescribed.[7]

A study of the need for low-vision services in blind school students in East Africa showed that 63.9 % of African blind school students had functional low vision. Forty-six per cent could read N5–N8 print unaided or with spectacles and a further 33 % could read N5–N8 with low-vision devices.[8] Personal observation by the author during a low-vision study tour to Kenya in May 2006 revealed extensive coverage and improvement in low-vision care meeting the needs of the affected children, thus reducing the unmet needs published 11 years earlier.[9] The two studies from Ghana in 1989[10] and 2003[3] showed identical causes of low vision and blindness which are predominantly preventable. Low-vision care was not operational, as all the students were taught Braille and none normal print. The uptake of low-vision care is picking up slowly. The impact is seen more in students outside the School for the Blind than within. Factors that are barriers to access range from parents' negative perceptions, societal/cultural misconceptions, and availability of resources, to absence of collaboration and coordination between low-vision care providers and weak national support. Parents in this region are not in favor of their children wearing normal spectacles and therefore low-vision devices are even more difficult to accept. Eye care providers are generally not enthusiastic about provision of low-vision services because it is time-consuming and of low economic gain.

Awareness of the unmet needs of children with low vision in Ghana gathered momentum since Vision 2020 was launched in 1999. The focus for the celebration of World Sight Day in Ghana in 2006 was low vision. One of the objectives of the last blind school study was to provide low-vision care to the affected after the needs assessment. This has been attempted before and was not sustained. This time the emphasis is on sustainability of the service and for the School for the Blind to own it while they are supported by the low-vision team from Korle Bu Teaching Hospital. There has been slow progress for intervention, but finally the School for the Blind for the southern part of Ghana has completed a low-vision care facility on campus with the support of Sightsavers International which hopefully will soon be operational. In our experience with pediatric low-vision care in Korle Bu Teaching Hospital, clients usually come from families within the lower socioeconomic groups and often find the low-vision devices unaffordable. The background of the clients in the School for the Blind is similar and the parents of the students wish that care of the blind and partially sighted would be free. A successful program for intervention is more likely to succeed when initially subsidized, at least until a reasonable impact has been made with regard to intervention. One must, however, strike a good balance between cost recovery, which is more likely to ensure sustainability of the project, and subsidization. There is a need for not only ophthalmic evaluation but also refraction assessment for low-vision care intervention prior to admission to schools, and monitoring thereafter. In addition, training to use low-vision devices with print education should be introduced, along with teaching Braille, for those who have the potential to read print with devices, keeping in mind both the short- and long-term

visual prognoses determined by the natural history of visual impairment, depending on the cause.

A number of national and international initiatives that addressed interventions aimed at child health and survival have also had a positive impact on childhood eye diseases and childhood blindness, notably EPI (1974) and the UN Millennium Development Goals (2000). There is reasonable correlation between the prevalence of blindness in children and under-five mortality rates. Since Vision 2020 was launched WHO/Lions have established a child eye care center in Korle Bu Teaching Hospital with well-trained pediatric and low-vision teams and equipment and more affordable low-vision devices.

When Ghana has done away with corneal blindness, cataract would be the commonest preventable cause of blindness. Although the optical results of treating childhood cataract have improved dramatically over the last two decades, we are still challenged by the management of amblyopia and long-term follow-up, which is crucial for ensuring that the child has optimal optical intervention. In the future, we shall still be challenged by the non-preventable causes, and also add others, such as retinopathy of prematurity, found in the industrialized countries. Vision 2020 is an opportunity that gives hope to the blind and low-vision children that live difficult lives in the developing world. The number of 'blind person-years' resulting from blindness in childhood is second only to that from cataract and makes control of childhood blindness a Vision 2020 priority. Global achievement of Vision 2020 with regard to childhood blindness and low-vision rehabilitation will not be realized if sub-Saharan Africa is left behind. More support is required from within and without for intervention. We look forward to moving forward in the right direction, by using basic research on low vision and blindness for planning purposes to research and achieve sustained interventional programs. The challenge of putting the knowledge and skills acquired to control avoidable childhood blindness and enhance vision for the incurable with low vision confronts the service providers. One of the strategies is to plan and execute strong advocacy programs that will appeal to the hearts and minds of all who are able to support. ■

1. Gyasi ME, Setting the pace for Vision 2020 in Ghana: the case of Bawku Eye Care Program, *Community Eye Health*, 2006;19(59):46–7.
2. Ajaiyeoba AI, Isawawumi MA, Adeoye AO, Oluleye TS, Prevalence and causes of blindness and visual impairment among school children in South Western Nigeria, *Int Ophthalmol*, 2005;26(4–5):121–5.
3. Ntim-Amponsah CT, Amoaku WMK, Causes of Visual Impairment and Unmet Low Vision Care in a School for the Blind, *Int Ophthalmol*, 2008;28:317–23.
4. State of the World's Children 2009, UNICEF, December, 2008.
5. World Health Organization, *Global initiative for the elimination of avoidable blindness*, WHO/PBL/97.61, Geneva: WHO, 1997.
6. Gilbert CE, Ellwein LB, Refractive Error study in Children Study Group, *Invest Ophthalmol Vis Sci*, 2008;49:877–81.
7. Sloan L, Reading aids for the partially sighted – factors which determine success or failure, *Arch Ophthalmol*, 1968;76:101–5.
8. Silver J, Gilbert CE, Spoerer P, Foster A, Low vision in east African blind school students: Need for optical low vision services, *Br J Ophthalmol*, 1995;79:814–20.
9. Low Vision Services Provided by the Low Vision Project-Kenya. Available at: http://icevi.org/publications/icevix/workshops/ 3FL02 0262.html. (accessed October 2005).
10. Akafo SK, Hagan M, Causes of childhood blindness in Southern Ghana–a blind school survey, *Ghana Med J*, 1990;24:113–9.