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Causes of Blindness in a Special Education School

Les Causes De Cécité Dans Une École Spécialisée

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ABSTRACT

BACKGROUND: **Blind children and young adults have to overcome a lifetime of emotional, social and economic difficulties. They employ non-vision dependent methods for education.**

OBJECTIVE: **To assess the causes of blindness in a special school in southwestern Nigeria to aid the development of efficient blindness prevention programmes.**

METHODS: **A cross-sectional survey of the Ekiti State Special Education School, Nigeria was conducted in May–June 2008 after approval from the Ministry of Education. All students in the blind section were examined for visual acuity, pen-torch eye examination and dilated fundoscopy in addition to taking biodata and history.**

RESULTS: **Thirty blind students with mean age of 18±7.3 years and male: female ratio of 1.7:1 were examined. Blindness resulted commonly from cataract eight (26.7%), glaucoma six (20%) retinitis pigmentosa four (16.7%) and post-traumatic phthysis bulbi two (6.7%). Blindness was avoidable in 18 (61%) of cases. Glaucoma blindness was associated with redness, pain, lacrimation and photophobia in 15 (50%) and hyphaema in 16.7% of students; none of these students were on any medication at the time of study.**

CONCLUSION: **The causes of blindness in rehabilitation school for the blind are largely avoidable and glaucoma-blind pupils face additional painful eye related morbidity during rehabilitation. While preventive measures and early intervention are needful against childhood cataract and glaucoma, regular ophthalmic consultations and medications are needed especially for glaucoma blind pupils. WAJM 2011; 30(1): 47–50.**

Keywords: **Blindness; glaucoma; rehabilitation; retinitis pigmentosa; Nigeria.**

RÉSUMÉ

CONTEXTE: *Les enfants et jeunes adultes aveugles doivent surmonter une vie faite de difficultés affectives, sociales et économiques. Sur le plan éducatif, ils utilisent des méthodes non-voyantes.*

OBJECTIF: *L'objectif de ce travail était d' évaluer les causes de cécité dans une école spécialisée au sud-ouest du Nigeria et d'aider à l'élaboration de programmes de prévention efficaces contre la cécité.*

MÉTHODES: *Une enquête transversale dans une école spécialisée de l'État d'Ekiti au Nigeria a été menée en Mai-Juin 2008, après l'approbation du ministère de l'Éducation. Tous les élèves de la section-aveugles avaient bénéficié d'un interrogatoire, de mesures biographiques, d'un examen de l'acuité visuelle, d'un examen des yeux avec un stylo-torche et d'un fond d'œil après dilation des pupilles.*

RÉSULTATS: *Trente étudiants aveugles avec un âge moyen de 18 ± 7,3 ans et un sexe ratio de 1,7/1 en faveur des hommes ont été examinés. La cécité résultait de la cataracte dans huit cas (26,7%), du glaucome dans six cas (20%), de la rétinite pigmentaire dans quatre cas (16,7%) et d'une phtisie bulbaire post traumatique dans deux cas (6,7%). La cécité était évitable dans 18 cas (61%) . La cécité par glaucome était associée à une rougeur, douleur, larmoiement et à une photophobie dans 15 cas (50%) et aussi à une hyperhémie dans 16,7% des cas. Aucun des étudiants n'était sous traitement au moment de l'étude.*

CONCLUSION: *Les causes de cécité à l'école de réhabilitation pour aveugles sont en grande partie évitables. Les élèves atteints de cécité par glaucome font en plus face au cours de la réhabilitation à des douleurs oculaires en rapport avec la morbidité. En même temps que des mesures de prévention et une intervention précoce soient nécessaires contre la cataracte de l'enfant et le glaucome, des consultations ophtalmologiques régulières et des traitements sont aussi requis en particulier pour les élèves atteints de cécité par glaucome.* ***WAJM 2011; 30 (1): 47–50.***

Mots-clés: *Cécité, Glaucome, Réhabilitation, Rétinite Pigmentaire, Nigeria.*

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Abbreviations: ESSES, Ekiti State Special Education School.

INTRODUCTION

Blindness imposes far-reaching physical, psychosocial, emotional and economic implications on the affected individual, the family and the society in general.[1] This is particularly more so in children and young adults where blindness may involve a large number of blind years. Globally, childhood blindness causes 75 million blind years; this is second only to the number of blind years from cataract blindness.[2] Blind children and young adults are faced with a lifetime of emotional, social and economic difficulties due to their disability.[3] Previous reports have shown that 75% of the 1.4 million blind children globally live in the developing countries.[4] Population surveys require very large number of children to determine causes of blindness considering the relatively low prevalence of the condition[5]. Studies conducted in schools for the blind thus serve as useful alternatives in determining the causes of blindness in children and young adults.[6–8] Non-visually dependent education is provided for blind pupils using the special school educational service model in schools for the blind.[8]

Wide regional variations exist in the aetiology of blindness as a reflection of the level of socioeconomic development; non-avoidable causes are more prevalent in developed countries as opposed to avoidable causes in low income countries.[4] Corneal opacity was the leading cause of blindness reported in a Congolese school for the blind; while cataract and glaucoma were the most important causes of blindness at the Parcelli School for the blind in Lagos, Nigeria.[6,9] Avoidable blindness accounted for 60% of blindness in pupils of school for the blind in Congo compared to 41.2% in China.[9,10] Reports of the causes of blindness are useful in planning effective blindness prevention programmes.[11]

This study was conducted to assess the causes of blindness in a special education school in southwestern Nigeria.

SUBJECTS, MATERIALS, AND METHODS

A cross-sectional survey of the pupils of the blind section of the Ekiti State Special Education School [ESSES] at Ikerre-Ekiti in southwestern Nigeria was conducted between May and June 2008. The ESSES provides formal education for children with blindness, deafness, and mental retardation; it receives pupils from Ekiti, Ondo, Osun and some parts of Edo States of Southwestern Nigeria. The approval for the study was obtained from the Ekiti State Ministry of Education and the school's principal. Verbal consent was taken from the students prior to commencement of the study. All the students were institutionalized and are taught by both seeing and blind teachers. The school had a sick bay manned by a trained nurse. New intakes into the school are placed in special class until they can read Braille enough to commence primary education.

Procedure

A structured questionnaire was administered to all participating blind students to obtain their biodata, history of eye disease/blindness and present ocular complaints. Additional information was provided by the teachers and the school nurse. Onset of blindness from birth was considered congenital. Visual acuity was assessed for each eye using the illiterate E chart or Snellen's Chart placed 6 meters away from each eye in a well lighted classroom and further testing was carried out for ability to recognize and count fingers, hand movement and ability to perceive light or otherwise for each eye. Each eye was assessed using a bright pen-torch to examine the eye lids, the conjunctiva, cornea, anterior chamber, pupils and lens in a semi-darkened room. Dilatation of the pupil was achieved using Tropicamide 0.5% eye drops administered twice at 15 minutes interval. Fundoscopy was carried out using Keeler professional ophthalmoscope in a dark staff office.

Findings were recorded and diagnosis for each eye was made based on the history and examination findings. The World Health Organization's definition of blindness of visual acuity less than 3/60 in the better eye was adopted.The World Health Organization's definition of blindness of visual acuity less than 3/60 in the better eye was adopted. The cause of blindness was determined based on the diagnosis made. In students with different diagnosis in the two eyes, the diagnosis with the most avoidable cause was recorded as the cause of blindness. Blindness caused by treatable or preventable eye diseases was considered avoidable.

Data were entered into SPSS version 13 and analyzed for frequency. Summary results are displayed in Tables and barcharts, average values are presented as mean ± SD.

RESULTS

Out of 171 students in the ESSES, 30 (17.5 %) were blind and constituted the study population. The male to female ratio was 1.7: 1 and their ages ranged from 4–26 years with a mean of 18±7.3 years. The age and sex distribution are reported in Table I. Blindness had been present from birth in 12(41.4%) of the students. Thirteen (43.3%) were in primary school level, 14(46.7%) in secondary school while 3(10%) were in special class.

Table 1: Distribution of Blind Students in Ekiti State Special Education School by Age and Sex

Age Group	Number (%)		
(years)	Male	Female	Total
1 – 5	1(50)	1(50)	2(6.7)
6 – 10	2(40)	3(60)	5(16.7)
11 – 15	1(33.3)	2(66.7)	3(10)
16 – 20	7(77.8)	2(22.2)	9(30)
21 – 25	5(71.4)	2(28.6)	7(23)
26 – 30	3(75)	1(25)	4(13)
Total	**19(63.3)**	**11(36.7)**	**30(100.0)**

Table 2: Distribution of Participants by Onset of Blindness and Visual Acuity

Characteristic	Number (%)
Onset of Blindness	
Congenital	12(41.4)
Non-congenital	18(58.6)
Total	**30(100.0)**
Visual Acuity	
Counting Fingers	4(13.3)
Hand motion/ light perception	15(50.0)
No Light perception	11(36.7)
Total	**30(100.0)**

The characteristics of the student with regards to their current class, period of onset of blindness and their visual acuity are shown in Table 2 Twenty-six (86%) of the students had previous ophthalmic examinations. Four (13.3%) students had previous eye surgeries - three had cataract extraction and one student had enucleation. The lens eight (26.7%), optic nerve eight (26.7%) and the whole globe six (20%) were the leading anatomical sites causing blindness (Figure 1). Cataract eight (26.7%), glaucoma six (20%), and retinitis pigmentosa 4 (13.3%) were the leading causes of blindness among the students (Table 3).

About 75% of the students with cataract had previous eye examination. Two had unilateral aphakia and one bilateral pseudophakia following cataract extraction with no improvement in vision. Nystagmus was present in seven(87.5%) of students with cataract while one student with cataract had no nystagmus. Glaucoma was responsible for blindness in six (20%) of pupils; it was associated with bulphthalmos in three (50%); redness, watering and photophobia in three (50%), hyphema in one (16.7%) and unilateral phthysis bulbi in one (16.7%) of the glaucoma blind students. None of these pupils were on any medications at the time of the study and none had previous glaucoma surgery.

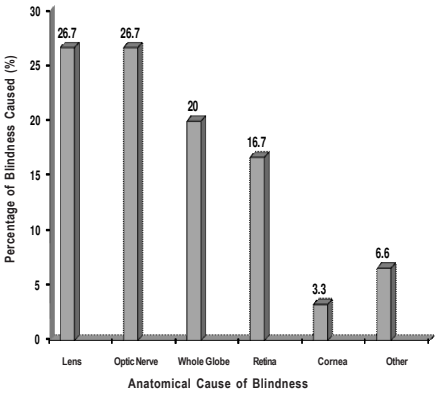

Fig. 1: Anatomical Classification of the Causes of Blindness

Table 3: Ddistribution of Participants by Cause of Blindness

Cause	Number (%)
Cataract	8 (26.7)
Glaucoma	
Bulphthalmos	3 (10.0)
No bulphthalmos	3 (10.0)
Microphthalmos/anophthalmos	3 (10.0)
Post traumatic phthysis bulbi	2 (6.7)
Anterior staphyloma	1 (3.3)
Retinitis pigmentosa	4 (13.3)
Presumed *LCA	1 (3.3)
Hypoplastic optic disc	1 (3.3)
Optic atrophy	1 (3.3)
Keratoconus	1 (3.3)
Chronic uveitis	1 (3.3)
Symblepharon /ankyloblepharon	1 (3.3)
Total	**30(100.0)**

**LCA, Leber's Congenital Amaurosis*

Congenital microphthalmos/ anophthalmos represented 50% of the whole globe group. Bilateral phthysis bulbi was present in two students, both cases following bilateral ocular trauma. Usher's syndrome was considered in a deaf student with retinitis pigmentosa. Blindness caused by cataract, glaucoma, trauma, staphyloma and chronic uveitis, considered avoidable, constituted 61%.

DISCUSSION

Cataract was the most frequent cause of blindness in this group similar to findings reported by Akinsola *et al*[9]. This differs from reports from blindness rehabilitation schools in Congo and Northern Nigeria where corneal scars were the leading cause of blindness.[6,7] The difference in geographical location of the areas studied may be contributory. Childhood cataract is a potentially avoidable blinding disease which leads to a large number of blind years. Early diagnosis and surgical treatment are required for good visual outcome as delayed surgery in the presence of amblyopia usually results in poor visual outcome.[12–14] The absence of vaccination against rubella has been implicated as contributory to high rate of congenital cataract in underdeveloped countries.[13,15] Glaucoma was the second leading cause of blindness in this study; this is similar to previous reports.[6,7,9] Mass education on recognition of the symptoms will aid early detection, appropriate surgical intervention, and visual preservation in childhood and juvenile glaucoma.[16–18] Children whose glaucoma is well controlled after surgery (with or without adjunctive medical therapy) would nonetheless require a life-time monitoring and follow-up.[7] Blindness from retinitis pigmentosa can be a result of the disease itself or its complications including cataract and glaucoma.[19] Poor vision is the commonest mode of presentation in Nigeria with over 50% presenting blind.[20] Low visual aids and Braille education remain important sources of visual rehabilitation depending on the level of visual loss.

Irreversibly blind children and young adults obtain much education and rehabilitation using Braille to reduce the social, educational, and financial setbacks imposed by blindness. With a mean age of 18 years, the pupils were still young and hence would benefit from educational rehabilitation provided in the school rather than occupational or vocational rehabilitation. Blindness is considered as a disability with profound effect on education, social interaction, and family relationship.[21] In Ethiopia, blindness was the second most prevalent disability reported accounting for 28.6% of all disabilities.[22] Bilateral blindness requires rehabilitation with non-visually dependent learning which could be provided in a dedicated school as the ESSES. In this study, many glaucoma blind children still had associated eye morbidities of redness, watering, photophobia and pain unlike other students. These acute painful disorders in the blind pose additional challenge and psychological stress which may affect their learning and rehabilitation. Blindness was avoidable in 61.0% of the pupils including blindness from cataract, glaucoma, trauma, staphyloma and chronic uveitis. Extant eye care requirement among the blind pupils of ESSES included cataract extraction with intraocular lens implantation and medications for the glaucoma blind students.

Effective public health measures such as rubella immunization and health education will assist in preventing congenital blindness and encourage early presentation for treatment. Regular specialist eye care is still required during rehabilitation of blind pupils especially those blind from glaucoma.

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