PEDIATRIC OPHTHALMLOGY AND STRABISMUS

Pediatric Refractive Errors in Lautech Teaching Hospital Eye Clinic, Osogbo, Osun State

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Introduction: Refractive errors are a known cause of visual impairment and may cause blindness worldwide.[1] In most developing countries, there is no established vision-screening program for children on commencing school.[2] Vision disorders occurring in childhood may carry on into adulthood and become a problem later in life such as educational attainment and job choices.[3] Preventing amblyopia and strabismus are other reasons which are to be considered for the necessity of early correction of refractive errors. This study set out to determine the pattern of presentation of refractive errors in children attending a prototype clinic in Southwest Nigeria. This will now serve as a pilot study for community work to be done.
Methods: A descriptive study of consecutive children aged 3–16 years seen over a 2 years period between 2010 and 2012. Presenting complaints, presenting visual acuity, age, and family history of spectacle wear from childhood or youth were obtained.
Children with refractive errors but without associated organic abnormalities were included. Less than 3 years old + associated organic pathology and or aphakic refractive errors were excluded. The written informed consent was obtained from parents while ethical clearance was obtained from LTH Ethical Committee.
Results: One-hundred eighty children were studied. Age ranged between 3 and 16 years with a mean of 1.7 ± 0.51; and modal age group 11–16 years (70.6%) standard deviation 0.56. 75.6% presented with normal vision, 20% with visual impairment and 23.3% with low vision. Females almost doubled the males in number (66.1% and 33.9%, respectively).
Regular astigmatism was significantly more common among those with astigmatism ($P < 0.001$). The most common diagnosis was simple myopic astigmatism (41.1%), then myopia, anisometropia, and compound myopic astigmatism with 21.7%, 10.6%, and 8.9%, respectively [Tables 1 and 2].
Conclusion: A good percentage of these children (females than males) have significant error which was correctable by glasses. Health education of school children, parents, teachers, and public should be intensified to prevent visual impairment and low vision.
Mandatory school eye health screening policies at entry into every level of school are advocated.

Table 1: Distribution of the common types of refractive errors

Diagnosis	*n* (%)	Total (%)
Cylindrical errors		
Simple myopic astigmatism	74 (41.1)	105 (58.3)
Compound myopic astigmatism	16 (8.9)	
Mixed astigmatism	15 (8.3)	
Spherical errors		50 (27.8)
Myopia	39 (21.7)	
Hypermetropia	11 (6.1)	
Anisometropia		19 (10.6)
Malingering		6 (3.3)
Total		180 (100)

Table 2: Distribution of the types, grades, and axes of refractive errors

Types	Grades	Dioptric power	Frequency %	χ^2 and *P*
Myopia	Low	−0.25–−1.00	36 (20.0)	
	Moderate	−1.25–−3.75	16 (8.9)	
	High	−4.00 and above	15 (8.3)	
Hypermetropia	Low	+0.25–+1.00	28 (15.6)	
	Moderate	+1.25–+3.75	4 (2.2)	
Astigmatism	Low	−0.25–−0.75	97 (92.4)	
	Moderate	−1.00–−2.75	7 (6.7)	
	High	−3.00 and above	1 (0.9)	
Axes (*n*=105)	Regular		90 (85.7)	
	Irregular		15 (14.3)	

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Challenges in the Surgical Management of Pediatric Cataract in a Secondary Health Facility in Kaduna

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Background: Cataract is an important cause of childhood blindness that has economic and social effects in terms of the blind years.[1] Hence, early detection and treatment will increase the quality of life, but the peculiarity of the surgery and postoperative care is challenging.
Objective: To determine the presentation and challenges encountered in the management of pediatric cataract cases in a secondary health care facility.
Methods: Retrospective review of all pediatric patients that had cataract surgery at the eye clinic of Barau Dikko Hospital, Kaduna, Nigeria, between November 2010 and July 2013. Surgery was performed by lens aspiration or extracapsular extraction with intraocular lens implantation by visiting surgeons and supported by a nongovernmental organization. The sociodemographic characteristics, clinical history, and findings of the patients were extracted from patient records and analyzed by SPSS version 20 (IBM, Armonk, NY, USA).
Results: The mean age at presentation was 6.78 years and that at which cataract was detected before the presentation is 3.76 years. There were 35 (70%) males and 15 (30%) females. Table 1 shows the distribution of types of cataract while Table 2 shows the ocular comorbidity. Surgery was carried out on 65 eyes of 50 patients, 4 (8%) in 2010, 28 (56%) in 2011, 1 (2.0%) in 2012, and 17 (34%) in 2013. Twelve (24%) patients were seen at 1-week follow-up. Five (10%) patients had retinoscopy, but only 4 (8%) obtained glasses. Moreover, 1 (2%) patient was treated for amblyopia. The challenges identified included: Surgeons were visiting, late presentation, patients not attending follow-up, poor record keeping, irregular surgery sessions, anesthesia problems, lack of visual rehabilitation, withdrawal of financial support by partners, and inadequate government's financial commitment.
Discussion: Delayed presentation may be due to poverty, ignorance, and long distance traveled to access care. Similar trend has been reported in other studies.[2-4] Follow-up is less than in centers where surgeries are routinely performed.[2-4] Low level of amblyopia treatment

Table 1: Distribution of type of cataract

Type	Frequency (%)
Congenital	19 (38)
Developmental	8 (16)
Traumatic	21 (42)
Others	2 (4)
Total	50 (100)

Table 2: Distribution of ocular comorbidity

Comorbidity	Frequency (%)
Strabismus alone	10 (20)
Nystagmus alone	3 (6)
Strabismus+nystagmus	9 (18)
Corneal opacities	3 (6)
Strabismus+microphthalmos	2 (4)
Microphthalmos alone	1 (2)
No comorbidity	22 (44)

and refraction could prevent a good proportion from achieving best corrected visual acuity. The solutions to these challenges include a well-structured resident pediatric ophthalmology team, community screening and early referral, health education for sustained follow-up visitation, and government's commitment.

Conclusion: The surgical management of pediatric cataract in a secondary facility has several challenges, effective strategies are needed to overcome them.

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Pediatric Traumatic Cataract: Review of Etiology and Visual Outcome in National Eye Center, Kaduna, Nigeria

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Introduction: Traumatic cataract is a significant cause of blindness in childhood population in developing countries.[1-3] Different types of ocular injuries are associated with traumatic pediatric cataract. The visual outcome of traumatic cataract may be influenced by associated ocular sequelae of the initial trauma such as optic atrophy, retinal detachment, and vitreous hemorrhage.[4] There is paucity of data on the outcome of pediatric traumatic in Nigeria. The aim of this study was to provide the information on current knowledge gap in pediatric traumatic cataract in Nigeria.

Objectives: (1) To identify the type of ocular injuries associated with traumatic cataract among children presenting to the National Eye Center, Kaduna, Nigeria. (2) To evaluate the visual outcome of pediatric traumatic cataract among patients presenting to the National Eye Center, Kaduna, Nigeria.

Methods: The theater register of pediatric ophthalmology department of National Eye Center, Kaduna, Nigeria, was reviewed from January to December 2013 and cases of traumatic cataract were recorded. Demographic information, cause of the trauma, presenting visual acuity, associated ocular injury, surgery performed, and postoperative complications, as well as duration of follow-up, were recorded. The traumatic cataract cases were classified into closed globe and open globe groups according to the Birmingham Eye Trauma Terminology System.

Results: A total of 42 eyes of 42 patients were reviewed. There were 29 (69.0%) males and 13 (31.0%) females. The mean age at presentation was 8.4 years (range: 3.5–12.6 years). Twenty-six (61.9%) right eyes and 16 (38.1%) left eyes were affected. The mean duration of the follow-up was 7.7 months (range: 1–36 months). There were 25 eyes in the closed injury group and 17 eyes in the open injury group. Nineteen eyes of the closed injury group had preoperative presenting visual acuity of light perception (LP), five had counting fingers (CFs), and one had 6/60. In the open globe group, 16 eyes had visual acuity of LP and one eye had CF. Blunt trauma was the most common cause of closed globe injury in 26 eyes while sharp object was the most common cause of open globe injury in 16 patients. At the last postoperative follow-up visit, 12 patients had postoperative unaided visual acuity of 6/36, nine had CF, and five had LP in closed injury group. In the open globe injury group, nine patients had visual acuity of 6/36, five had CF, and two had LP.

Discussion: The retrospective analysis in our study revealed that more boys were affected with traumatic cataract than girls. Similar finding was reported by other researchers.[5] The right eyes were also more affected than the left eyes. The majority of the children had closed globe injuries. It was also found that blunt ocular trauma was the major cause of blunt ocular trauma.

Conclusion: Blunt ocular trauma was the most common injury recorded, and that vision can be salvaged in pediatric traumatic cataract with cataract surgery.

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A Descriptive Study of Strabismus in Osogbo, Nigeria

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Background/Introduction: Strabismus is a condition in which there is misalignment of the visual axis.[1] A study done in the United Kingdom found that about 4% of adults had squint with a report of high levels of negative psychosocial effects such as effects on relationships, work, and self-esteem.[2] In Minnesota, strabismus was seen among some children who had become aware of the condition through comments made.[3] Apart from the poor cosmetic appearance and loss of binocularity associated with it, the strabismic eye is often associated with poor vision or blindness.[4] The need to correct it before the brain attains full development is therefore very necessary in a growing child. In addition, surgical correction has been documented to give an increase in field of vision especially following surgery for esotropia.[5]

Objective: This study aimed to describe the profile of strabismus and attitudes to uptake of strabismus surgery in Osogbo.

Methods: This is a descriptive study of consecutive new patients seen in a tertiary clinic over 2 years between January 2011 and December 2012. Sociodemographics was obtained. The types of strabismus, degree of deviation, visual acuities, sensory tests, interest in surgical correction, reasons for refusal of surgery, associated refractive errors, and other ocular pathologies were evaluated.
Results: Thirty-four participants were seen, in which males were 41% and females 59%. Mean age was 29.7 ± 18.5 years. Students (35%) and children (7.6%) were affected. The most common type of squint was exotropia with deviation of 50 prism diopters (PDs) in 35%, and 60 PD (21%), followed by esotropia (14.7%). Fifty-nine percent presented with normal vision, (visual acuity [VA] 6/6-6/18) while 23.5% presented with severe visual impairment (VA <6/60-3/60). The most common etiologies were congenital (47%) and organic (chorioretinal scar) 11.8%. Extraocular muscles were restricted in 15%, associated inferior oblique overaction was present in 3%, absent binocular single vision in 84%. Thirty percent had strabismus surgery done while 70% refused surgery. The most common reasons for refusal were fear (29%) and cost (24%). Associated ocular pathologies were amblyopia (18%) and congenital cataract (6%). Refractive error was associated in 19% of cases.
Conclusion: The most common causes of strabismus were congenital. These required surgical correction but fear of surgery was the most common hinderance. Health education is required to assist in uptake of strabismus surgery.

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The Case Report of a Family with Autosomal Dominantly Inherited Primary Congenital Glaucoma

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Introduction: Glaucoma is a group of diseases that have in common a characteristic optic neuropathy with associated visual field loss, and for which elevated intraocular pressure (IOP) is a primary risk factor.[1] Congenital glaucoma (CG) is rare - 1:10,000 births.[2] CG may be primary (isolated trabeculodysgenesis) or secondary to other ocular or systemic anomalies. Clinical features of primary CG depend on the time of elevated IOP, which could begin *in utero* (true), before age 3 (infantile), or between 3 and 16 years of age (juvenile).[3]
Case Report: We report the case of three members of a family of five, all of whom had hereditary CG. **Case 1:** The first case, T.E, is a 7-year-old boy born with large eyes. On examination, the visual acuity (VA) was hand motion [HM] in the right eye [RE] and 4/60 in the left eye [LE]. RE vertical (↑) corneal diameter was 15 mm, and the horizontal (→) diameter was 15 mm and hazy. Initial IOP was 24 mmHg (RE) and 22 mmHg (LE) despite regular use of timolol eye drops and diamox tablets. His diagnosis was CG. He had bilateral trabeculotomy and trabeculectomy (TrabTrabe) with Mitomycin C (MMC) application. Last IOP 2 months postoperative was 8 mmHg (RE) and 10 mmHg (LE), and VA 5/60 (RE), 5/60 (LE). **Case 2:** The second case, T.B, is an 11-year-old girl who was noticed to have poor vision by hospital staff members. While leading her glaucoma-blind mother to receive treatment of her younger brother who had CG (case 1), T.B was noticed to be bumping into objects. Her VA was NPL (RE) and 6/18 (LE) with apparent tunnel vision as she could not see central visual field (CVF) targets. Corneas were clear and corneal diameters were within normal limits. Initial IOP was 34 mmHg (RE) and 28 mmHg (LE). Her diagnosis was juvenile glaucoma (JG). She had bilateral TrabTrabe with MMC. Her last IOP was 05 mmHg (BE) and VA was NPL (RE) and 2/60 (LE).

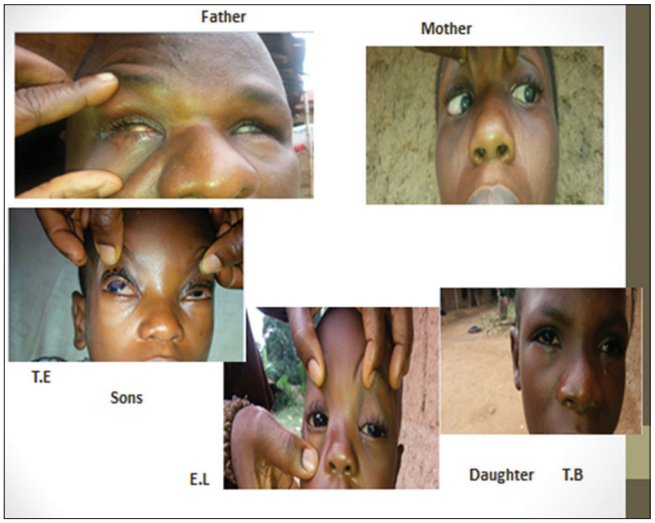

Figure 1: Parents and children with childhood glaucoma

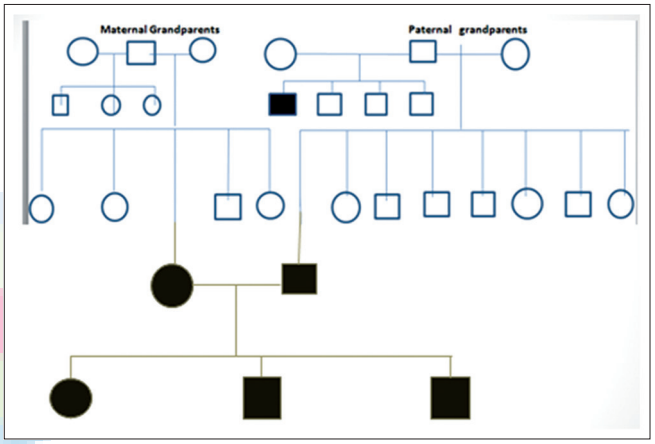

Figure 2: The pedigree

Case 3: Case 3, E.L, is a 4-year-old boy who was noticed to have large eyeballs similar to his elder brother and was presented at the hospital. On examination, VA was 6/24 (BE). Corneal diameter was 14.5 mm ↑ and 15 mm → but clear. Initial IOP was 25 mmHg despite being said to be regular on Timoptol (BE). He was uncooperative for CVF. His diagnosis was CG. He had bilateral TrabTrabe with MMC. Last IOP 2 months postoperative was 13 mmHg (RE) and 9 mmHg (LE), and VA was 6/24 (BE). **Parents:** His father was reported to have big eyeballs (buphthalmos) at birth and subsequently became blind without receiving orthodox treatment. His mother was reported to have gotten blind at the age of 9 years and went to the school for the blind. Examination of both parents showed that the mother had NPL in BE, IOP was high (35 mmHg), corneal diameter was within normal limits while the father also had NPL in both eyes with opaque large cornea in the RE while the left eye was phthisical. The males (cases 1 and 3) have primary CG (like father) while the female has JG (like mother) [Figure 1].
Discussion: Most cases are sporadic, but 10% is inherited in an autosomal recessive form with incomplete penetrance.

The transmission is autosomal dominant since no generation is skipped as shown by the pedigree Figure 2.

Conclusion/Recommendation: Intermarriage between childhood-glaucoma couple has a devastating impact on their children, none of whom was spared of blinding glaucoma in childhood. We advocate counseling to discourage marriage between blind individuals whose cause of blindness is inheritable. Awareness efforts should be intensified.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Surgical Management of Pediatric Glaucoma

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Introduction: The management of pediatric glaucoma is challenging because of the differences in the anatomy of a child's eye as opposed to that of an adult, differences in the behavior of the tissues of the glaucomatous eye of a child, the varied etiology of the disease, and the difficulties with postoperative management. The aim of this manuscript is to review the different surgical techniques currently available, their indications, results, and most common complications, so as to assist the surgeon to make an informed surgical choice in managing pediatric glaucomas.

Methods: A PubMed search was carried to review the evidence for all the available surgical options, their indications, surgical outcome, common complications, and management.

Discussion: Surgery is the mainstay of management of pediatric glaucomas. Medical management may be used initially to lower intraocular pressure before surgery or as an adjuvant after partially successful surgical procedures. The main goal of management is to preserve sight and lower intraocular pressure. Angle surgery (goniotomy or trabeculotomy – conventional or circumferential) is the procedure of choice for primary congenital glaucoma with the exact choice dictated by corneal clarity and the surgeon's experience and preference. When the results of both goniotomy and trabeculotomy were compared in several studies,[1,2] the conclusion was that they were similar and satisfactory. The aim of goniotomy is to remove obstructing tissue that causes the retention of aqueous, thereby restoring the access of aqueous to Schlemm's canal, thus maintaining the physiologic direction of outflow. In general, goniotomy is preferred in children <1-year-old with good visibility of angle structures while trabeculotomy is the procedure of choice in children with poor visualization of angle structures. More recent studies, however, advocate filament-assisted circumferential trabeculotomy over goniotomy as a primary procedure even in patients with clear corneas due to greater success when compared to goniotomy.[3] A 360° filament trabeculotomy, achieved surgical success in 87–92% of patients after 1–4 years of follow-up in a study.[4] The illuminated microcatheter (itrack) improves the safety of filament trabeculotomy by allowing continuous visualization of filament tip and allows rapid detection of misdirection. Trabeculotomy and trabeculectomy with mitomycin C have been recommended in patients with severe glaucoma with very high intraocular pressures and cloudy cornea. Trabeculectomy alone, when performed by experienced childhood glaucoma surgeons, can be associated with good outcomes in appropriate cases. Glaucoma drainage devices have a higher success rate and a lower complication rate when compared with trabeculectomy. It has a definitive role in managing infants and other children with glaucoma refractory to angle surgery and trabeculectomy. Baerveldt and Ahmed implants are most commonly used. Cyclodestructive procedures in pediatric glaucoma are usually reserved for those challenging cases that have failed multiple more conservative treatments and for those patients with anatomic abnormalities that preclude traditional surgeries. Currently, there is little evidence for other surgical procedures such as deep sclerectomy and trabectome in the management of pediatric glaucomas.

Conclusion: Pediatric glaucomas are quite challenging to manage. The first surgical operation is often the best chance, and it is important that the most experienced surgeon chooses the most appropriate operation.

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WHO/Lions Club International Foundation Project on the Elimination of Avoidable Childhood Blindness: The Results so Far

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Introduction/Background: The first phase of the Lions–World Health Organization project for the elimination of avoidable childhood blindness led to a child-friendly eye care center established in University College Hospital (UCH), Ibadan, Nigeria, in 2008. However, UCH was quite a distance for some patients from other states.

Objective: To establish a satellite eye center that would be accessible and affordable, sponsored by WHO/LCIF grant of equipment.

Methods: The sociodemographics, clinical, and surgical records

Figure 1: Ultrasonic pachymeter

Table 1: Report sent to World Health Organization office in January–November 2014

WHO/LCIF project on the elimination of avoidable childhood blindness

Country: Nigeria

Implementing institution name (Osun State teaching hospital and specialist hospital, Osogbo satellite centre)

Project in charge: Prof. Bayeroju/Dr. Isawumi/Other Consultant Ophthalmologists/Medical Officers/Pediatric Ophthalmology Residents/Ophthalmic nurses/General Nurses/Optometrist/ Other Health workers

Indicators of achievement Provision of eye care services for children	
Eye care services for children	**Number seen in 2014**
Vitamin A mass distribution	Minimum of 1000
Number of children screened in outreach camp	168
Number of outreach camp	1
Children screened in school	1200
Children screened in the school for the blind	Yet to be done
Children from outreach referred to secondary care	15
Outpatient department screening clinic (new cases only)	Clinic 1: 86 Clinic 2: 301
ROP screening	Under planning
Low vision services	2 referred
Total	389
Low vision devices	

Provision of eye care services for children Children screened in outreach camp	
Disease pattern	**Number seen in 2014**
Congenital cataract	4
Congenital glaucoma	1
ROP	0
Low vision	1
Refractive errors	35
Others	100

WHO: World Health Organization, LCIF: Lions Clubs International Foundation, ROP: Retinopathy of prematurity

of patients in Osogbo satellite center seen are reported biannually. Community or school screening for children are also done. Workshop on eye care is supposed to help other health workers to identify and refer cases to Ophthalmologist

Figure 2: Theater session at State Specialist Hospital, Asubiaro using the TOPCON operating microscope

Results: The total number of new patients seen in clinic between July 2013 and May 2015 is 1722 while the number of surgeries/rehabilitation in similar years is 195 [Table 1]. Equipment was received between June and July 2014 and are being put to use [Figures 1 and 2].

Discussion and Conclusion: Childhood blindness is commoner in poorer regions. This is because some of the predisposing diseases and risk factors are not common in industrialized countries (e.g., measles, vitamin A deficiency, ophthalmia neonatorum, malaria).[1] Most of the causes of blindness in sub Saharan Africa are avoidable,[2] and its elimination is one of the priorities of the VISION 2020 initiative.[3] An established, growing and child friendly satellite eye centre has therefore been established in Osogbo.

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