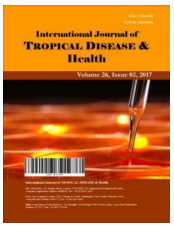

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Ocular and Systemic Abnormalities Associated with Paediatric Cataract at Evangelical Church of West Africa Eye Hospital, Kano

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Authors' contributions

This work was carried out in collaboration between all authors. Author AAO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors BF and SOA managed the analyses of the study. Author SOA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: Cataract is a leading cause of childhood visual impairment in developing countries. Cataract in children causes the blurring of retinal images and therefore disrupts the development of the immature visual pathways in the central nervous system with subsequent development of amblyopia if there is no timely surgical intervention. There are several associations of pediatric cataract- both systemic and ocular which have considerable consequences on the management and post operative outcomes.
Aim: To identify the systemic and ocular associations of childhood cataract presenting in Evangelical church of West Africa (ECWA) Eye Hospital, Kano, Nigeria from 2006 to 2014.
Methods: This was a prospective study of 694 children (1388 eyes) with 881 lens opacity seen at

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ECWA Eye Hospital, from January 2006 to December 2014. One hundred and eighty-seven children (26.9%) had bilateral cataract. All the patients had comprehensive paediatric review and their parents interviewed.

Results: Seven hundred and thirty eyes (82.8%) had cataract with associated ocular abnormalities: Nystagmus (22.5%), Squint (17.3%), Corneal opacity (8.8%), Microcornea (2.7%), Megalocornea (8.2%), Vascularized cornea (0.8%), Congenital glaucoma (10.4%), Iris coloboma (1.6%), Peripheral synaechiae (3.7%), Abnormal lens anatomy (6.6%). Ninety-eight children (14.1%) had various forms of associated systemic abnormality: Congenital Health Diseases, Deafness, Mentally Retarded, Cerebral Palsy, Down's Syndrome, Failure to Thrive, Mumps and Asthma.

Keywords: Ocular association; paediatric cataract; systemic association.

1. INTRODUCTION

Childhood cataracts are responsible for 5% to 20% of blindness in children worldwide and for an even higher percentage of childhood visual impairment in developing countries [1]. The prevalence of childhood cataract varies from 1.2 to 6.0 cases per 10,000 infants worldwide [2]. In Nigeria, 75 million are estimated to be children under 15 years, out of which 75,000 (1%) are blind from various causes, the leading cause of which is cataract [3,4].

There are several causes of childhood cataract, frequently associated with ocular and systemic pathologies. These associations often determine the timing of interventional measures, the method of anesthesia to be administered, the post surgical complications and outcomes.

Children may have a congenital cataract, present at birth or shortly thereafter, which may be unilateral or bilateral. Approximately half of the bilateral cataracts and majority of the unilateral cataracts in children are idiopathic in nature [5]. Bilateral infantile cataracts are more common with systemic diseases and more likely to be inherited, whereas unilateral cataracts are commonly associated with other ocular abnormalities [5]. Important causes of childhood cataracts include: genetic disorders, syndromes such as trisomy 21, intrauterine infection, metabolic disorders, drug induced, trauma (penetrating or blunt, possibly with injury to other parts of the eye) and other ocular disorders like uveitis, aniridia, microphthalmia, persistent fetal vasculature (PFV) and anterior segment cleavage syndrome or be a result of treatments such as radiation or corticosteroid therapy [5,6]. Many of the eyes with congenital cataract, however, also have other abnormalities that increase the risk of complications. Developmental cataracts, not present at birth but develops during early childhood, may also occur. In developed countries, hereditary cataracts are the most common type of congenital cataract [7]. In some developing countries, approximately 25% of infantile cataracts are due to congenital rubella infection [8]. In infants, visually significant congenital cataracts need to be removed promptly to prevent irreversible deprivation amblyopia. However, surgery for these cataracts can sometimes be delayed if vision is developing normally, though lamellar or posterior cataracts may progress quickly and require intervention [6]. This study aims to identify the systemic and ocular associations of childhood cataract presenting in our locality.

2. MATERIALS AND METHODS

This was a prospective study of 694 children (1388 eyes) with cataract in 881 eyes: 187 children (26.9%) bilateral, seen at ECWA Eye Hospital, from January 2006 to December 2014. Exclusion criteria: Children with traumatic cataract and non- consenting parents to the study. All the patients had a comprehensive paediatric review and their parents interviewed by a trained interviewer. Detailed ocular evaluation was done with the aid of hand-held slit-lamp biomicroscopy, tonometry with tono-pen, gonioscopy; ocular A and B-ultrasonography, visual field tests and optical coherence tomography (for children≥4 years), Anterior segment optical coherence tomography were done where indicated. Examination/ Investigations under anaesthesia were carried out for children of 3 years and below as well as UN cooperative older children. Auxiliary medical laboratory investigations: Full Blood Count, Serum Electrolytes, Urea and Creatinine, Blood group and Genotype, Auditory evaluation, Electrocardiography, Echocardiography, Electro-encephalography were done were necessary. Where multiple ocular or systemic abnormalities existed, the most prominent (from clinical judgement) was adopted. The patients' ages,

gender, relevant family history, past medical and ocular history were recorded. Data was analysed with statistical package for social sciences (SPSS) version 20 (IBM Corp. Armonk, NY). Ethical approval for the study was obtained from the Ethics Committee of the University of Port Harcourt Teaching Hospital before the commencement of the study.

3. RESULTS

The mean age of participants was 2.03±2.5years with a range of 3months to 14 years. The difference in the ages of participants of study participants was not statistically significant (p=0.979).

Most of the patients presented with visual impairment (58.8%) and blindness accounted for 30.8%. Only 10.4% of the participants had fairly good visual acuity on their first presentation to the hospital. Uni-ocular cataract accounted for 73.1% of the cases. Seven hundred and thirty eyes (82.8%) had associated ocular abnormalities. The distribution of the forms and the proportion of the abnormalities among the 881 eyes are shown in Table 2. The commonest ocular co-morbidity was nystagmus (22.5%) and the least was pannus (vascularised cornea) (0.8%).

The mean duration of cataract symptom before presentation to the hospital among the study participants was 5.7±4.3months with a range of 3 months to16months.

Ninety-eight participants in this study (14.1%) had one form of associated systemic abnormality or the other as shown in Fig. 1. The commonest systemic abnormalities associated with childhood cataract in this study were congenital heart disease (26.5%) and Down's Syndrome (22.5%) while the least disease was mumps (2%).

Table 1. Distribution of age and gender of the study population

Age group	Gender				Total (Percent)	
	M	(%)	F	(%)		
0-12 months	250	(36.0)	148	(21.3)	398	(57.3)
>1-3 years	92	(13.2)	58	(8.4)	150	(21.6)
>3-7 years	70	(10.1)	40	(5.8)	110	(15.9)
Above 7 years	22	(3.2)	14	(2.0)	36	(5.2)
Total	434	(62.5)	260	(37.5)	694	(100)

Pearson Chi-Square Test = 0.194, p-value =0.979

Table 2. Ocular characteristics of eyes with congenital cataract at presentation

Presenting visual acuity	Number	Proportion %
6/6-6/18 (Good)	144	(10.4)
<6/18-3/60 (Visual impairment)	816	(58.8)
<3/60- NPL (Blind)	428	(30.8)
Eye affected with cataract		
Uniocular cataract	507	(73.1)
Right Eye	324	(63.9)
Left Eye	183	(36.1)
Bilateral cataract	187	(26.9)
Ocular co-morbidity		
Proptosis	86	(11.8)
Conjunctival chemosis	42	(5.7)
Nystagmus	164	(22.5)
Squint	126	(17.3)
Corneal Opacity	64	(8.8)
Microcornea	20	(2.7)
Megalocornea	60	(8.2)
Vascularised Cornea	6	(0.8)
Congenital glaucoma	76	(10.4)
Iris coloboma	12	(1.6)
Peripheral Synaechia	26	(3.7)
Abnormal lens anatomy	48	(6.6)

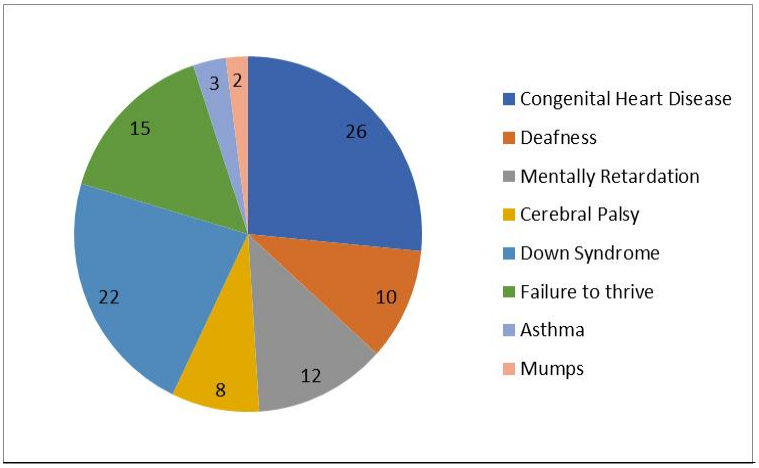

Fig. 1. Associated systemic abnormalities in the study population

Table 3. Duration of cataract before presentation to the hospital

Duration of cataract	Frequency	Percent (%)
0-12 months	398	57.3
>1-3 years	150	21.6
>3-7 years	110	15.9
>7 years	36	5.2
Total	694	100

4. DISCUSSION

This study was conducted to identify the systemic and ocular associations of childhood cataract among 694 children with cataract that presented at the outpatient clinic of Evangelical church of West Africa (ECWA) Eye Hospital, Kano, Nigeria from 2006 to 2014. Out of 1388 eyes examined, 881 eyes (63.5%) had cataract. Seven hundred and thirty cases (82.8%) were uni-ocular cataract. Right uni-ocular cataract accounted for 63.9% of the total cataract cases (Table 2).

Four hundred and thirty-four participants (62.5%) were males and 260 (37.5%) were females. Male: Female ratio was 1.7:1. The mean age of participants was 2.03±2.5 years with a range of 3months to 14 years. The difference in the ages of the participants in this study was not statistically significant (Table 1). However, the most frequent age of congenital cataract in this study was 0-12months and the least common age group was 7 years and above. There was male preponderance of cases with congenital cataract. It was observed that patients presented late to the hospital after the onset of symptoms of poor vision. The average duration of cataract symptom before presentation to the hospital among the study participants was 5.7±4.3 months (Table 3). The time of the presentation of paediatric ocular diseases to healthcare facilities varies from country to country, probably because of differences in awareness of the disease among the various populations, the availability and accessibility of medical facilities and personnel and possibilities of obtaining satisfactory treatment. This late presentation to the hospital facility could be related to ignorance of the symptom of the disease on the part of the parents, financial constraints and preference to alternative healthcare at prayer houses or traditional healers. In a cohort study in Egypt, Zomor et al. observed that the mean duration of symptoms was 9.9 weeks before presentation to the hospital for bilateral cases while unilateral cases of retinoblastoma presented quite longer [9]. Waddell et al. and Kishiki et al. had noted that a significant number of children remain blind because of deprivation amblyopia, surgical complications, and limited rehabilitation in developing countries due to the delayed time is taken for treatment and limited resources [10,11]. Sangma et al in Assam, India observed that out of 288 children operated for childhood cataract over 40% presented at 9 years of age or older[12]. Sangma et al. attributed late presentation of paediatric cataract patients to lack of knowledge of the availability of eye health care services and economic barrier [12]. Our finding on late presentation of paediatric patients to the hospital was also similar to the study done in Ghana by Ilechie et al. where it was observed that 54.0% of the patients presented at age 11 months and above [13]. Similarly, in Nepal, Shrestha et al.

noted that about one-third (32%) of paediatric ophthalmic patients presented within the age of three years whereas more than two-fifths (46%) presented at the age eight years and above [14].

In this study, 730 eyes (82.8%) had cataract with associated ocular abnormalities: Nystagmus (22.5%), Squint (17.3%), Corneal opacity (8.8%), Microcornea (2.7%), Megalocornea (8.2%), Vascularized cornea (0.8%), Congenital glaucoma (10.4%), Iris coloboma (1.6%), Peripheral synaechiae (3.7%), Abnormal lens anatomy (6.6%), (Table 2). Also, our study compares with that of Summers et al. who observed that associated ocular abnormalities of childhood cataract were decreased vision (20%), nystagmus (19%), cataract in the other eye (15%), iris heterochromia (9%), myopia (6%), microphthalmos (6%), pupillary miosis (2%), congenital glaucoma (2%), optic nerve abnormality (2%), aniridia (1%), and corneal opacity (1%) [15].

Many textbooks have long lists of syndromes and systemic diseases/abnormalities possibly associated with childhood cataracts, but none lists the relative frequencies of these causes [16]. In this study, 98 (14.1%) of the study population had one form of associated systemic abnormality or the other as shown in Fig. 1: Congenital Health Diseases (16.3%), Deafness (10.2%), Mentally Retarded (12.2%), Cerebral Palsy (12.2%), Down's Syndrome (22.5%), Failure to Thrive 15.3%), Mumps (2.0%) and Asthma (Fig. 1). Most of these pathologies associated with congenital cataract in our study such as Congenital heart disease, Deafness, mentally retardation, Down's syndrome and asthma were found to be associated congenital abnormalities. Failure to thrive was found to be as a result of combination of malnutrition and poor environmental factors while mumps was as a result of infection with the mumps virus. Wirth et al. in their study noted that out of the 342 paediatric cataract individuals with a negative family history, 16% were associated with a recognised systemic disease or syndrome of which Down's syndrome was the leading associated syndrome with congenital cataract [17].

5. CONCLUSION

Our study participants had cataract associated with other ocular abnormalities: Nystagmus, squint, corneal opacity, microcornea, megalocornea, vascularized cornea, glaucoma, iris coloboma, peripheral synaechiae, abnormal lens anatomy, vitreous haemorrhage and retinal detachment. Associated systemic abnormalities in this study were: Congenital health diseases, deafness, mental retardation, cerebral palsy, Down's syndrome, failure to thrive, mumps, asthma and dumbness.

CONSENT

Exclusion criteria: Children with traumatic cataract and non- consenting parents to the study.

ETHICAL APPROVAL

Approval for the study was obtained from the Ethics Committee of the University of Port Harcourt Teaching Hospital before the commencement of the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Foster A, Gilbert C. Epidemiology of childhoodblindness. Eye. 1992;6:173-176.
2. Lambert SR, Drack AV. Infantile cataracts. Surv Ophthalmol. 1996;40:427-458.
3. Frick KD, Foster A. The magnitude and cost of global blindness: An increasing problem that can be alleviated. Am J Ophthalmol. 2003;135:471-476.
4. Guthoff RF, Schittkowski MP. Childhood blindness. VISION 2020 and experiences in an African city. Ophthalmologe. 2007; 104(10):849-854.
5. Srivastava KK. Childhood cataract: Aetiology and management. Community Eye Health. 2004;17(50):33-34.
6. Whitman MC, Vanderveen DK. Complications of pediatric cataract surgery. Seminars in Ophthalmology. 2014;29:5-6, 414-420.
7. Merin S, Crawford JS. The etiology of congenital cataracts. A survey of 386 cases. Can J Ophthalmol. 1971;6:178-182.
8. Eckstein MB, Vijayalakshmi P, Killedar M, et al. Aetiology of childhood cataract in south India. Br J Ophthalmol. 1996;80:628-632.
9. Zomor HE, Nour R, Alieldin A, Taha H, Montasr MM, Moussa E, et al. Clinical

presentation of intraocular retinoblastoma; 5-year hospital-based registry in Egypt. Journal of Egyptian National Cancer Institute. 2015;27(4):1-9. Available:http://dx.doi.org/10.1016/j.jnci.2015.09.002

10. Waddell KM. Childhood blindness and low vision in Uganda. Eye (Lond). 1998; 12(Pt 2):184-192.
11. Kishiki E, Shirima S, Lewallen S, Courtright P. Improving postoperative follow-up of children receiving surgery for congenital or developmental cataracts in Africa. J AAPOS. 2009;13(3):280-282.
12. Sangma CA, Singh A, Bhattacharjee H. Barrier analysis and outcome of paediatric cataract surgery in under privileged children of Assam, India. IOSR Journal of Dental and Medical Sciences. 2016;15(5): 50-53.
13. Ilechie AA, Essuman VA, Enyionam S. Prevalence of congenital eye anomalies in a paediatric clinic in Ghana. Eastern Mediterranean Health Journal. 2013;19(2).
14. Shrestha UD, Shrestha MK. Clinical profile of paediatric cataract and surgery in a tertiary eye care centre, Nepal. J Nepal Paediatr Soc. 2012;32(1):14-18.
15. Summers CG, Letson RD. Is the phakic eye normal in monocular pediatric aphakia? Journal of Pediatric Ophthalmology and Strabismus. 1992;29(5):324–327.
16. Halder G. Lectures on the operative surgery of the eye. London: Burgess and Hill. 1823;362.
17. Wirth MG, Russell-Eggitt IM, Craig JE, Elder JE, Mackey DA. Aetiology of congenital and paediatric cataract in an Australian population. BJO. 2002;86(7): 782-786.

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