

Research Article

Profile of Pediatric Ocular Morbidity in the in-Patient Department of an Apex Public Hospital

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Abstract

Background: This study aimed at determining the causes of pediatric ocular morbidity in the in-patient department of an apex public hospital in Bangladesh where dedicated pediatric ophthalmology services have been established with the collaboration of Government and International NGOs.

Patients and Methods: This was a descriptive study using cross sectional data. All patients admitted in pediatric ophthalmology department during the period of January to June, 2014 were enrolled in this study. Age at the time of noticing the symptom first, time of reporting to hospital, current age and gender of the children were recorded. The clinical diagnosis was grouped according to disease category. Results were analyzed using SPSS version 17.

Results: A total of 676 children were admitted for treatment of 902 eyes in pediatric ophthalmology department during the study period. There were 372 (55%) boys and 304 (45%) girls, resulting boys to girl's ratio of 1.2:1. In this study, the most common type of disease was childhood cataract, constituting 48.28% of the admitted patients, followed by ocular injury (21.76%), ptosis (5.16%), strabismus (4.96%) and retinoblastoma (3.85%). These diseases were identified as important causes of childhood ocular morbidity.

Conclusion: The critical issues in the management of childhood blindness are early diagnosis, timely intervention and follow-up for long time. Addressing childhood blindness requires not only quality treatments but also needs the understanding of potential beneficiaries, awareness among health providers and addressing of socio-demographic factors for immediate reporting.

Keywords: Pediatric ocular morbidity; Congenital cataract; Strabismus

Introduction

Vision is an important key for successful life. Visual impairment in early life may lead to permanent visual disability later on. Timely intervention is essential for proper development of vision. Elimination of blindness in children is one of the priorities of the World Health Organization's VISION 2020 program. Childhood blindness is second only to cataract in terms of 'Blind years' [1].

Eye problems in children can have a severe negative impact on their education, personal development and economic productivity. The impact of eye problem is greater and has severe consequences in poorer regions of the world where resources and educational supports are not enough.

The causes of blindness among children are changing over time. Corneal scarring due to vitamin A deficiency is declining in many developing countries because of child survival programs (integrated management of childhood illness) [2]. Retinopathy of prematurity is now emerging as an important cause of irreversible blindness in the middle-income countries of Latin America and Eastern Europe and is likely to become an important cause as well in Asia over the next decade. The prevalence of refractive errors, particularly myopia, is increasing among school-age children.

This study was conducted to determine the childhood ocular

problem from the patients admitted in the pediatric ophthalmology department in a tertiary public hospital in Dhaka, Bangladesh.

Methods

National Institute of Ophthalmology and Hospital in Dhaka, Bangladesh serves as an apex public eye hospital. This is the only public apex hospital in the country providing specialized pediatric eye care services for self-reported and referred patients.

This is a descriptive study using cross sectional data. All patients admitted in pediatric ophthalmology department during the period of January to June, 2014 were the study population. A total of 676 children were admitted for the treatment of 902 eyes in the pediatric ophthalmology department during the study period. Each eye was considered as a case of study. Mothers of the children were interviewed to know the socio-demographic characteristics. Age at time of noticing symptom first, time of reporting to hospital, current age and gender of the children were recorded. The clinical diagnosis was grouped according to disease category. The ethical approval was obtained from the ethical committee of National Institute of Ophthalmology and Hospital on 11/11/2013 following all procedures accordingly.

In this study, the age of the children (study population) ranges from one day to sixteen years. All parents/guardians who came with

Table 1: Distribution of Socio-Demographic Characteristics of Study Population.

Characters	N	%
Father's Education		
Illiterate	250	37
Primary Completed	169	25
Secondary Completed	142	21
Graduate & Above	115	17
Mother's Education		
Illiterate	257	38
Primary Completed	162	24
Secondary Completed	169	25
Graduate & above	88	13
Father's Occupation		
Farmer	176	26
Unskilled worker	183	27
Business	189	28
Service	128	19
Mother's Occupation		
House-wife	466	69
Unskilled worker	115	17
Business	34	5
Service	61	9
Residence		
Urban	223	33
Rural	453	67

the children to the pediatric eye department were informed about the study. An informed consent has been taken from each parents/guardians before the patient was selected for the study. A thorough history of disease was taken from the parents/guardians, followed by a general and systemic examination which was performed by the investigators. A structured questionnaire was used to record all information that is relevant to the study.

Ocular examination was performed with visual acuity using different methods (Snellen/LogMAR chart, Cardiff cards and K pictures) according to age and intelligence of the children. Fixation and the ability to follow light in children below one year were tested by using a pen torch. Cardiff cards, K pictures or Sheridan Gardner Singles/ linear were used to assess visual acuity in children aged 2 and 3 years respectively.

Slit lamp bio-microscope was used for examination of the anterior segment of the eye including the eyelids, conjunctiva, cornea, anterior chamber, iris, pupil, lens, and anterior vitreous. Intraocular pressure measurement was assessed by Perkins tonometer in suspected cases of glaucoma. An indirect ophthalmoscope was used to examine the posterior segment where ever possible. Strabismus assessment was done to determine the type and angle of deviation.

Results were analyzed using SPSS package version 17.

Table 2: Distribution of Childhood Eye Diseases across Age Groups.

Diseases	0-1 Year	1-2 Years	2-5 Years	5-10 Years	10-15 Years	Total eyes N (%)
Cataract	36	82	135	130	94	477 (48.28)
Strabismus	-	4	15	12	17	48 (4.96)
Glaucoma	16	3	5	1	2	27 (2.73)
Orbital	9	8	13	11	5	46 (4.66)
Ptosis	4	7	21	9	10	51 (5.16)
Retinoblastoma	12	21	5	-	-	38 (3.85)
Ocular Trauma	11	29	73	47	55	215 (21.76)
Total	88 (9.76%)	154 (17.07%)	267 (29.60%)	210 (23.28%)	183 (20.29%)	902 (100%)

Results

During the present study period a total of 676 children were admitted in the pediatric ophthalmic in-patient department. Majority of the patients reported from rural area (67%) and had low level of parental education. Table 1 shows the socio-demographic characteristics of the children admitted in this hospital.

The age range of the patients was 2 months to 15 years with a mean age of 5.8 years. The highest frequency of admission was recorded in the age groups of 2-5 years, constituting 29.6% of the patients. There were 372 (55%) boys and 304 (45%) girls, resulting in boy-girl ratio of 1.2: 1 (slight boy preponderance).

Childhood eye diseases across age groups in this study population are shown in Table 2. Childhood cataract was the most common ocular disorder among the admitted during the study period and it accounts for 48.28% of the study subjects. A large number of these cases were between the age group of 2-5 years followed by 5-10 years. Ocular injury was the second most common disease seen among these children (21.76%). Ptosis was the third common disorder, affecting 51(5.16%) cases.

In this study out of 477 childhoods cataract 37.94% (181) cases were congenital cataract, 43.45% (208) were developmental cataract and 18.45% (88) were traumatic cataract. Among the 181 cases of congenital cataract only 20% of cases were admitted within 3 months of age and 45% were admitted at the age of more than 3 months to 1 year (Figure 1). The study results show that the difference between 1st noticed and hospital presentation varies from 6 months to 5 years in different situation (Table 3).

Discussion

The results of this study are expected to provide information on the current causes of visual impairment and blindness among children attending at the tertiary eye center.

National Institute of Ophthalmology & Hospital (NIO&H) receives a large number of patients from all corners of the country. In the pediatric ophthalmology department of NIO&H, quality eye care facilities developed with the collaboration of Govt. and International NGOs (Sight-savers International and Orbis International) where pediatric eye care services are free of cost or subsidized.

In this study, the ratio of boys to girls was 1.2:1. Thus the findings suggest that boys are more affected in all the diseases. The predominance of boys in eye disease is consistent with previous

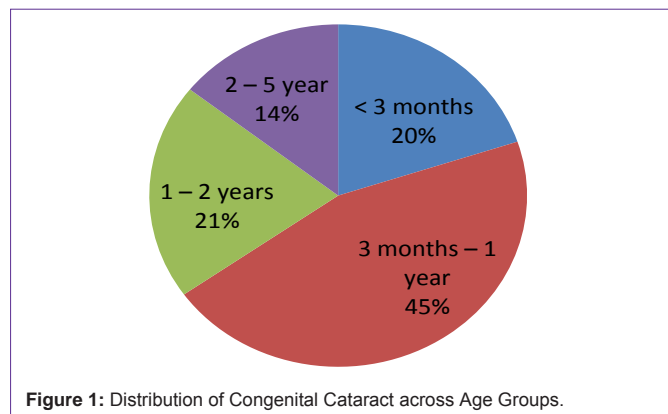


Figure 1: Distribution of Congenital Cataract across Age Groups.

Table 3: Mean Age -First Notice of Symptoms and Hospital Admission.

Diseases	1 st Noticed Mean age ± SD	Hospital Admission Mean age ± SD
Congenital Cataract	3 months (± 1.5)	16 months (± 3.5)
Congenital Glaucoma	2.5 months (± 1.3)	12 months (± 2.5)
Strabismus	3years (± 0.5)	8 years (± 1.2)
Ptosis	1 years (± 0.5)	4 years (± 0.6)
Retinoblastoma	1.5 years (± 0.8)	2 years (± 0.5)

research [3]. The reason might be that boys are greatly valued by social culture and get priority in bringing to hospital for treatment.

The most common eye problem of children in this study was childhood cataract (Table 2). Out of 477 childhood cataract 37.94% cases were congenital cataract, 43.45% were developmental cataract and 18.45% were traumatic cataract. Among the 181 cases of congenital cataract only 20% of cases were admitted within 3 months of age and 45% were admitted at the age of more than 3 months to 1 year (Figure 1).

The findings of this study suggest that the critical period for complete bilateral congenital cataracts is 2 to 3 months of life. For better visual outcome, surgery must be performed before the children are 3 months old. Early surgery leading to better visual results provided that optical correction is started early [4]. Several studies show that surgery is needed to perform timely to restore sight [5,6] after that sensory deprivation occurs [7].

Parents, family members and persons concerned in the care of children should be aware of the importance and consequence of congenital cataracts and it is their responsibility to ensure prompt referral to the ophthalmologists for timely intervention.

Ocular injury itself accounted for 215 (21.76%) cases with majority of penetrating corneal injuries. Injury was seen to have a male preponderance (58%), occurring mainly in the age group of 5-10 years. The frequency of eye injuries among children is remarkably high and a major cause of unilateral non- congenital visual impairment and blindness worldwide [8,9]. The major incidence of ocular injury occurs in children during playing with sharp and unsafe materials. Incidence of ocular injury is significantly higher in boys in all countries [8]. Community based surveys carried out in Botswana [10] and Saudi Arabia [11] on childhood blindness noted ocular injuries as a leading cause of unilateral blindness. Dulal et al. found that most ocular trauma is preventable by simple measures [12]. Raising public

awareness on playing with dangerous toys and improvement of home and school safety measure is essential.

In this study, 4.96% of cases were strabismus. Several studies suggested that early detection and treatment improves vision outcomes and psychosocial wellbeing for children with strabismus. However, many cases of strabismus go unrecognized. As patients with pediatric strabismus are usually of before school age (with an average onset at 1-4 years), population-based pre-school screening programs have been advocated as a way to reduce the rate of untreated strabismus and amblyopia [13,14]. In our country there are some misconceptions about childhood strabismus, 'it will be cured in course of time, not affecting eye sight'. There is also myth for strabismus that 'it is a matter of good luck'. All pediatric patients with newly diagnosed strabismus require timely referral to an ophthalmologist for a comprehensive assessment of visual function. Treatment for strabismus should begin as soon as possible to prevent amblyopia and loss of binocularity.

About five percent (5.16%) of the patients were suffering from ptosis of which 41.1% were within the age group of 5-10 years (Table 2). The most serious problem associated with childhood ptosis is amblyopia. Amblyopia can occur more frequently as ptosis tends to change the optics of the eye, causing astigmatism and constant blurring of the visual image. So it is very important that children with ptosis have regular ophthalmic examinations early in life to protect them from the serious consequences of untreated amblyopia.

Pediatric glaucoma needs to be treated differently than adult glaucoma. Most patients require surgery at early age. In this study only 2.73% (27) of cases were admitted for the treatment of congenital glaucoma (Table 2). The admission of fewer cases of congenital glaucoma might be for the poor case identification and referral linkage. Early recognition of the symptoms and signs of glaucoma and prompt referral to a pediatric ophthalmologist will ensure the best possible outcomes; including preservation of their vision. Follow-up is an integral part of patient eye care in children suffering from glaucoma. So attention should be given by parents and caregivers to understand that elevated IOP can recur at any age of a child with primary congenital glaucoma.

Retinoblastoma is a malignant eye tumor and its cure rate exceeds 90% in developed countries because of early diagnosis [15]. In low-income countries, cure rates are less than 50%, mainly because of the advanced stage of the disease at the time of reporting [16-18]. In this study, 3.85% (38) of cases were admitted for retinoblastoma. Most of the cases were of within 2 years of age. For early diagnosis, parents and primary care providers should recognize leukocoria (white pupil), the most common initial sign of retinoblastoma [15], and promptly refer the child to an ophthalmologist trained in the management of retinoblastoma to restore sight and life.

The study results show that the difference between 1st noticed and hospital presentation varies from 6 months to 5 years in different situation (Table 3). The barrier for early reporting and intervention are due to lack of awareness among the potential beneficiaries and access to services, because of distance, cost, and fear. Preventing visual loss, or ensuring the correct treatment at the right time to restore visual function of a child, will have a major impact on child's development [19].

Conclusion

This study will contribute to plan and to evaluate the appropriate preventive and curative services for avoidable causes of blindness among children. Children cannot complain and cannot take responsibilities for them but they are dependent upon the decisions of their parents or other family members. Their socioeconomic status and access to primary health care and eye care services play an important role in this context. Appropriate strategies are needed for identification, referral and treatment to deal with the burden of childhood blindness.

References

- World Health Organization. Preventing blindness in children. Report of a WHO/IAPB scientific meeting. WHO/PBL/00.77. Geneva: WHO, 2000.
- World Health Organization. Global programme for vaccines and immunization. Expanded programme on immunization. EPI information system. Global summary. WHO/EPI/GEN/98.10. Geneva: WHO. 1998.
- Zahra KB, Shakeel A, Asad AK. Spectrum of ophthalmic diseases in children of a referral hospital. *Pak J Ophthalmol.* 2007; 23.
- Taylor D, Vaegan, Morris JA, Rodgers JE, Warland J. Amblyopia in bilateral infantile and juvenile cataract. Relationship to timing of treatment. *Trans Ophthalmol Soc U K.* 1979; 99: 170-175.
- Birch EE, Stager DR. The critical period for surgical treatment of dense congenital unilateral cataract. *Invest Ophthalmol Vis Sci.* 1996; 37: 1532-1538.
- Cheng KP, Hiles DA, Biglan AW, Pettapiece MC. Visual results after early surgical treatment of unilateral congenital cataracts. *Ophthalmology.* 1991; 98: 903-910.
- Rogers GL, Tishler CL, Tsou BH, Hertle RW, Fellows RR. Visual acuities in infants with congenital cataracts operated on prior to 6 months of age. *Arch Ophthalmol.* 1981; 99: 999-1003.
- Niiranen M, Raivio I. Eye injuries in children. *Br J Ophthalmol.* 1981; 65: 436-438.
- Rapoport I, Romem M, Kinek M, Koval R, Teller J, Belkin M, et al. Eye injuries in children in Israel. A nationwide collaborative study. *Arch Ophthalmol.* 1990; 108: 376-379.
- Sudha N, William V, Graham E. Survey of childhood blindness and visual impairment in Botswana; *Br J Ophthalmol.* 2011; 95: 1365-1370.
- Foster A, Sommer A. Corneal ulceration, measles, and childhood blindness in Tanzania. *Br J Ophthalmol.* 1987; 71: 331-343.
- Dulal S, Ale JB, Sapkota YD. Profile of pediatric ocular trauma in mid western hilly region of Nepal. *Nepal J Ophthalmol.* 2012; 4: 134-137.
- Modi NC, Jones DH. Strabismus: background and surgical techniques. *J Perioper Pract.* 2008; 18: 532-535.
- Schmucker C, Grossefinger R, Riemsma R. Effectiveness of screening preschool children for amblyopia: a systematic review. *BMC Ophthalmol.* 2009; 9: 3.
- Abramson DH, Beaverson K, Sangani P, Vora RA, Lee TC, Hochberg HM, et al. Screening for retinoblastoma: presenting signs as prognosticators of patient and ocular survival. *Pediatrics.* 2003; 112: 1248-1255.
- Chantada G, Fandiño A, Manzitti J, Urrutia L, Schwartzman E. Late diagnosis of retinoblastoma in a developing country. *Arch Dis Child.* 1999; 80: 171-174.
- Carlos LL, Roberto RL, Victor TG, Carlos HG, Eduardo LP. Risk of dying of retinoblastoma in Mexican children. *Med Pediatr Oncol.* 2002; 38: 211-213.
- Rodrigues KE, Latorre Mdo R, de Camargo B. [Delayed diagnosis in retinoblastoma]. *J Pediatr (Rio J).* 2004; 80: 511-516.
- Clare Gilbert & Allen Foster. Childhood blindness in the context of VISION 2020 —The Right to Sight. Global initiative for the elimination of avoidable blindness. Action plan. 2006-2011.