

## Pattern of Ocular Morbidity among Children Referred Ophthalmology Dept. at Mugda Medical College Hospital, Mugda, Dhaka, Bangladesh

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<p><b>Abstract:</b> <i>Introduction:</i> Childhood ophthalmic disorders can seriously impact on development, education, future employment opportunities and quality of life. The consequences are especially severe in low resource settings where resources and education are lacking. Sub-optimal vision can lead to poor academic performance, a lack of interest in school, and even dropping out. <i>Objective:</i> To evaluate the pattern of various ocular morbidities among preschool children. <i>Methodology:</i> This was a cross sectional study conducted among 200 preschool children in the age group between 3 to 6 years at Dept. of Ophthalmology, Mugda Medical College Hospital, Mugda, Dhaka, Bangladesh from January 2022 to December 2023. We excluded children with some other comorbidities and children who were mentally retarded. Vision was assessed with Snellen's visual acuity charts and Kay Picture chart. Anterior and posterior segment examination was done using a hand-held portable slit lamp and a direct ophthalmoscope respectively. Binocularity was assessed with a cover test at a distance and near targets and the Hirschberg corneal reflex. The refractive status of the eyes was assessed by performing static retinoscopy. All the data was analyzed according to sex, age, causes of visual impairment and types of ocular morbidity. <i>Results:</i> Among the total 200 preschool children screened, 86 children were boys and 114 were girls. The prevalence of ocular morbidity was found to be 20.0%. Refractive error was the most common cause of visual impairment which was seen in 14.5% of children. The overall prevalence of myopia, hyperopia, and astigmatism was 7.5%, 4.5%, and 2.0% respectively. The other types of ocular morbidities were strabismus in 1.0%, congenital cataract in 1%, conjunctivitis in 1%, chalazion in 10%, vernal kerato conjunctivitis in 1% and congenital ptosis in 0.5%. <i>Conclusion:</i> The relatively high prevalence of refractive error and occurrence of other ocular morbidities in our studied population suggests that there is a need for a large-scale community-based preschool screening program in Bangladesh so that affected preschool children can be identified early and appropriate treatment can be promptly started.</p>	<p><b>Research Paper</b></p>
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	<p><b>How to cite this paper:</b> Md. Asaduzzaman (2024). Pattern of Ocular Morbidity among Children Referred Ophthalmology Dept. at Mugda Medical College Hospital, Mugda, Dhaka, Bangladesh. <i>Middle East Res J. Med. Sci.</i>, 4(3): 66-69.</p>
	<p><b>Article History:</b>   Submit: 22.05.2024     Accepted: 27.06.2024     Published: 29.06.2024  </p>
<p><b>Keywords:</b> Preschool Children, Refractive Error, Visual Impairment.</p>	
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### INTRODUCTION

Childhood ophthalmic disorders can seriously impact on development, education, future employment opportunities and quality of life. The consequences are especially severe in low resource settings where resources and education are lacking. Poor education and an inability to fully participate in daily life greatly add to the difficulty and suffering those children with poor vision or blindness experience. Eye diseases in children are an important reason for medical consultation [1] and children should receive prompt and proper eye care to avoid vision problems and eye morbidities [2]. Specifically, addressing childhood blindness is a

priority because these individuals are blind for several decades. Data on the prevalence and causes of blindness and severe visual impairment in children are required to appropriately plan and evaluate preventive and curative services, including special education and low vision services. The WHO has defined blindness as visual acuity worse than 3/60 in the better eye with best correction [1]. Childhood blindness is an important cause contributing to the burden of blindness worldwide [2]. The prevalence of childhood blindness is especially high in low-resource areas; among the blind children worldwide, 70-90% of them are in the poorest countries of Asia and Africa and the prevalence of blindness ranges from 0.3 / 1000 children in affluent countries to

1. 5 / 1000 children in very poor communities [3]. The majority of blindness is either potentially curable or preventable [4]. Although the prevalence of blindness in children is relatively low compared to adult populations, it negatively affects the development, education and employment opportunities of children, as well as the quality-adjusted life years of society as a whole. This can have far-reaching implications for the quality of life of children and the affected families [5]. Although eye examinations in early infancy are important, they cannot predict the occurrence of conditions that often appear after infancy, such as accommodative esotropia. Additional vision impairments may have emerged by then, and 3 years old are starting to gain the communicative abilities that allow them to be evaluated using methods similar to those used with adults. A particular advantage of examining vision in the age group of 3 years is that it allows intervention at a time when the problems are highly amenable to treatment [6]. The variability in the major causes of blindness in children from different parts of the world is determined by socioeconomic development and the availability of primary eye care services. In developed countries, lesions of the optic nerve predominate as the cause of blindness, whereas corneal scarring is the major cause in low-income countries [7]. The most frequently affected parts are the whole globe, cornea, retina, optic nerve, and lens [8]. Significant refractive errors should be detected early in life. Conditions like amblyopia, strabismus, and nystagmus are found to be prevalent in large numbers in the various records of the school screening done in different parts of our country. Ocular problems create a negative impact on the child learning and academic achievements in the future, leading to a decreased quality of life.

## METHODOLOGY

This was a cross sectional study conducted among 200 preschool children in the age group between 3 to 6 years at Dept. of Ophthalmology, Mugda Medical College Hospital, Mugda, Dhaka, Bangladesh from January 2022 to December 2023. We excluded children

with some other comorbidities and children who were mentally retarded. The schools were inspected for the suitability of the screening process in terms of length of the screening room which had to be more than 4 metres, had adequate light (at least 300 lux in the room and test chart illumination of about 500 lux) and was free from any distractions. After these preliminary adjustments, the children were examined under the supervision of the teachers in their respective schools. An informed consent was taken from the teachers/guardians prior to the examination. Demographics (gender, age, and ethnicity), family eye history, preterm history, medical history, and history of any ocular symptoms were all included in the questionnaire. All preschool children in the study were examined for distant visual acuity test and depth perception test using the Snellens distance visual acuity charts /kay pictures charts and Langsstereotest respectively. These tests were performed by an optometrist and a trained staff nurse. Binocularity was assessed by cover test at a distance and near targets and the Hirschberg corneal reflex test. Distance static retinoscopy at a working distance of 50 cm was used to determine refractive status. Anterior and posterior segment examination was done by a hand held slit lamp and direct ophthalmoscope respectively. Visual impairment(VI) was graded into mild, moderate and severe according to WHO criteria, i.e, visual acuity <6/18 was mild VI, visual acuity between 6/18 to 6/60 was moderate VI and visual acuity <6/60 was severe VI. The results of the study were statistically analyzed using SPSS version 22, using chi-square test. Results on continuous measurements are presented on mean  $\pm$  SD (min-max) and results on categorical measurement are presented in numbers (%). A P-value of <0.05 was considered statistically significant.

## RESULTS

Among 200 preschool children, the majority (57.0%) were female. The mean age of children was 5 years (table 1). The prevalence of ocular morbidity in this study was found to be 24.0 % (48 children). The proportion of ocular morbidity is shown in table 2.

**Table 1: Sex distribution of the study population (N=200)**

Sex	Frequency	Percentage
Male	86	43.0%
Female	114	57.0%

**Table 2: Types of ocular Morbidity (N=200)**

Types	Frequency	Percentage
Chalazion	4	2.0%
Congenital cataract	3	1.5%
Conjunctivitis	3	1.5%
Refractive error with mild visual impairment	17	8.5%
Refractive error with moderate visual impairment	11	5.5%
Congenital ptosis with mild visual impairment	1	0.5%
Congenital ptosis with no visual impairment	1	0.5%
Strabismus (Intermittent exotropia) with no visual impairment	3	1.5%

Types	Frequency	Percentage
Strabismus(exotropia) with mild visual impairment	1	0.5%
Bilateral pseudophakia	1	0.5%
None	152	76.0%
Vernal Keratoconjunctivitis	3	1.5%

Refractive error was the most common type of ocular morbidity which was seen in 15.5% of children (31). The overall prevalence of myopia, hyperopia, and

astigmatism was 16 (8.0%), 10(5.0%), and 5 (2.5%), respectively (table 3).

**Table 3: Refractive status of the patients (N=200)**

Refractive status	Frequency	Percentage
Astigmatism	5	2.5
Emmetropia	169	84.5
Hypermetropia	10	5.0
Myopia	16	8.0

The distribution of refractive error in both sex groups is mentioned in Table 4.

**Table 4: The distribution of refractive error in both sex groups (N=200)**

	Refractive error	No Refractive error	P-value
Male	17 (18.3%)	76 (81.7%)	0.948
Female	16 (14.9%)	91 (85.1%)	

The prevalence of refractive error in male is 17 (18.3%) as compared to female, 16 (14.9%) which is not statistically significant ( $p=0.948$ ). The other types of ocular morbidities were strabismus in 1.0%, congenital cataract in 1%, conjunctivitis in 1%, chalazion in 1.0%, Vkc in 1% and congenital ptosis in 0.5%. Visual acuity was assessed both monocularly and binocularly. Majority of preschool children had normal vision (169). Out of the children having visual impairment, 8.5% had mild visual impairment and 5.5% had moderate visual impairment. The cause of visual impairment in all children was refractive error except for 2 children in whom the causes were congenital ptosis and strabismus respectively.

## DISCUSSION

Children do not complain of defective vision, and may not even be aware of their problem. They adjust to the poor eyesight by sitting near the blackboard, holding the books closer to their eyes, squeezing the eyes and even avoiding work requiring visual concentration. This warrants early detection and treatment to prevent permanent disability. Children in the school-going age group (6-15 years) represent 25% of the population in the developing countries. The prevalence of ocular morbidity among preschool children in our study was found to be 20.0% which was similar to most of the studies around the world where percentages varied from 12.5% to 22.5% [9]. The prevalence of ocular diseases among preschool children in Malaysia was documented to be 14.5% which was lower than our study [10]. However, one study found that ocular morbidity was 24.5% among children in India which was higher than our study [11]. In the USA, a prevalence of ocular diseases and significant cusses

among school children was found to be 28.5% and previously undetected eye conditions being 19.5%, [12] that prevalence of ocular diseases markedly higher than in this study. This variation may be because of different sample sizes and the effect of mandatory school eye screening programs in their part of the world compared to ours where there is no any certified government policies which includes these sorts of screening programs. The most common ocular morbidity among preschool children was the refractive error (14.5%), which was also the most common ocular morbidity among children of different countries [13]. Myopia was the most common (8.0%) type of refractive error among the children which was consistent with some international studies [13,14]. In our study, the prevalence of myopia was 8.0%, which is more prevalent than in studies done in India, [15] Great Britain [16]. The more recent studies showed that Hong Kong (36.5%) and South India (32.0%) had a higher prevalence rate of refractive errors among school children of age 3 years -18 years as compared to this study [17, 18]. These differences may be explained by the different diagnostic criteria, the racial or ethnic variations, different age groups and different sample sizes in different studies. However, the lower prevalence of refractive errors (2.7-5.8%) has been reported among school children of age range 5-15 years from Finland, Africa and Chile [19]. This difference may be because of fewer participants in our study group compared to them and also the fact that the number of females is more in this study and vernal conjunctivitis is a disease commonly affecting the males [20]. This variation can be explained by the difference in geographical location, seasonal variations, different socioeconomic status and personal hygiene of children.

Children are a precious asset of the nation. Most of the ocular diseases observed in our study were either preventable or treatable but if neglected may lead to severe disabilities or blindness. As the burden of blindness is already high in our country, we have to go through a blindness prevention approach, beginning right from the early childhood and preschool and school eye-screening programmes should be an integral part of it.

## CONCLUSION

The relatively high prevalence of refractive errors and the presence of other eye diseases in our study population suggest that a large-scale community-based preschool screening program is needed in Bangladesh to identify affected children early and ensure that appropriate treatment can be initiated promptly. We also recommend follow-up studies on this subject. Screening examination of preschool children is recommended for early evaluation of eye diseases. This study could have been better if further follow-up to evaluate long-term visual acuity had been performed. Again, a multicenter study would have been better.

**Conflict of Interest:** None.

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