



## ORIGINAL RESEARCH ARTICLE

### OCULAR MORBIDITY AMONG PRIMARY SCHOOL CHILDREN

D Sherpa \*

<sup>1</sup> National Academy for Medical Sciences, Nepal Eye Hospital, Tripureshwar, Kathmandu.

\*Correspondence to: Dr Dakki Sherpa, MD, National Academy for Medical Science, Nepal Eye Hospital Tripureswar Kathmandu. Nepal.  
Email: dakki\_sherpa@yahoo.com

#### ABSTRACT

Knowledge of disease pattern in children can help design preventive and curative strategies. This study is conducted to determine the pattern of ocular morbidity among the primary school children. Children of primary school were included in this study. A complete eye examination was done in all children including loupe examination, refraction and Perkins tonometry. funduscopy were done in selected children. A total of 332 primary school children were included in the study, of which 332 children 99 (29.82 %) had ocular morbidity. Refractive error was the commonest type of ocular morbidity in 31 (9.33 %). Myopia was the commonest type of refractive error (84.77%) in contrast to hypermetropia (0.30 %). 27. Conjunctivitis was the second common type of ocular morbidity (17%). Among others, Convergence insufficiency in 17 children (5.12%), exodeviation in 10 children (3.01%), blepharitis in 5 children (1.5%), vitamin A deficiency in 5 children (1.50%), ocular trauma in 2 patients (0.60%) and styne in 2 children (0.60%) were found. Refractive error is the commonest form of ocular morbidity in primary school children.

**Key Words:** Primary school children, Refractive error.

#### INTRODUCTION

Blindness and visual impairment remain a major problem in the world today. There are an estimated 37 million people worldwide who suffer from blindness and 161 million who suffer from visual disability; around 80% of these are avoidable. <sup>1</sup> Cataract, which can be easily operated upon and cured, is responsible for more than half of the blindness in the world. Glaucoma, diabetic retinopathy, trachoma, uncorrected refractive error and childhood blindness make up the rest. According to the World Health Organization (WHO), the number of blind children in the world is approximately 1.4 million, and three-quarters of these live in the poorest regions of Africa and Asia. <sup>2</sup>

The Nepal Blindness Survey conducted in 1981 found relatively few cases of childhood blindness. The main causes of blindness in children in that survey were ocular infections, xerophthalmia, and congenital cataract. <sup>3</sup> The Nepal Xerophthalmia Survey, conducted in 1981, also showed that 1.65% of children below 14 years of age had Bitot's spot presumed to be due to vitamin A deficiency. <sup>4</sup> A refractive error study from the Mechi Zone of Nepal conducted in 1997 showed 2.9% children had visual morbidity of which 56% was due to refractive error. <sup>5</sup> However, no study has been done to evaluate the ocular morbidity in primary school children of Parsa which is a remote area of Chitwan in Nepal.

This study was conducted among government primary school of Parsa to screen and evaluate and treat common ocular problem where most of the children come from a poor socio-economic status.

#### MATERIALS AND METHODS

**Study design:** This is a cross-sectional descriptive study carried out in primary school children of Parsa in Chitwan district of Nepal. This study was conducted in July 2009.

**Sampling technique:** Convenience sampling technique was used for this study.

**Sample size:** Total 332 school children were included in this study.

**Inclusion criteria:** Children of the selected school were included in this study.

**Exclusion criteria:** Children not willing to co-operate and those who were absent during the study period were excluded.

A government school of Parsa was selected for this study. A study was conducted with aim to screen poor school children free of cost and to gather some information about ocular status of the school children of this school.

Children of primary section of this school (from nursery to class V) were included. The principal of the selected school was informed about the study and permission for the visit to the school was sought. The principal of the selected school informed the parents of the students regarding the study and permission was taken.

A team of ophthalmologist, ophthalmic assistants, orthoptist and driver went to the study place with all the necessary equipments required for ophthalmic examination.

Detailed history was taken and recorded in proforma.

- Visual Acuity- Unaided pinhole, and with glasses from a distance of 6 metres with help of illiterate E chart.
- Extraocular movements, cover tests, and convergence test using RAF rule
- Examination with a torch light and binocular loupe.
- Retinoscopy and subjective refraction
- Cycloplegic refraction when needed, followed by subjective refraction whenever needed.
- Fundus evaluation with a direct ophthalmoscope
- Fundus evaluation with dilated pupil when the vision is not fully corrected and in cases of traumatic eye injuries.

**Diagnostic Criteria**

Diagnosis of Myopia was made only when the myopic error was more than -0.5 dioptre spherical and hypermetropia when the error was more than + 0.75 dioptre spherical after cycloplegic refraction.

Astigmatism was diagnosed only when the error was more than 0.50 dioptre.

The diagnosis of amblyopia was made if the vision was 6/9 or worse after a careful cycloplegic refraction and meticulous fundus examination through dilated pupil, which helped to rule out other causes for non-improvement of vision.

Strabismus was diagnosed by recording simple corneal light reflex and cover tests.

Recording conjunctival dryness and Bitot’s spot with or without night blindness determined Vitamin A deficiency.

Statistical analysis was done using SPSS version 11.

**RESULT**

**Table 1: Age and sex distribution of school children:**

Age	Male		Female	
	Number	%	Number	%
0 - 5	13	3.91	10	3.01
5 - 10	56	16.36	59	17.77
10 - 15	110	33.12	84	25.30
Total	179	53.89	153	46.09

Minimum age was 4 yrs and maximum age was 15 yrs. Mean age was 10.677 with SD +/- 2.8868

**Table 2: Ocular morbidity pattern of school children**

Ocular morbidity pattern	Number	Percentage (%)
Refractive error	31	9.33
Conjunctivitis	27	8.13
Convergence insufficiency	17	5.12
Exodeviation	10	3.01
Blepharitis	5	1.50
Vitamin A deficiency	5	1.50
Ocular trauma	2	0.60
Stye	2	0.60

**Table 3. Refractive error pattern of school children**

Types of Refractive error	Number	Percentage (%)
Simple Myopia	26	83.87%
High Myopia	3	0.90%
Compound myopic		
astigmatism	1	0.30%
Hyperopia	1	0.30%

**RESULTS**

This was a prospective cross-sectional study done in a school of Parsa in Chitwan. Out of 332 primary school children, 99 children had some form of ocular morbidity which accounts for 29.82%.

Out 332 school children, there were 179(53.89%) male children and 153(46.09%) female children. The male: female ratio is 1.6:1. Minimum age was 4 yrs and maximum age included in our study was 15 yrs. Mean age of the children is 10.677 with Standard deviation of 2.8868. Majority of the children, 194 (58.43%) out of 332, were in the age range of 10 – 15 yrs. (Table 1)

Out of 332 school children, there were 99 (29.82%) school children with some form of ocular morbidity. Out of 332 patients, there were 31 children of refractive error (9.33%). Among others ocular morbidity, conjunctivitis in 27(8.13%), convergence insufficiency in 17(5.12%), exodeviation in 10(3.01%), blepharitis in 5(1.5%), vitamin A deficiency in 5(1.50%), ocular trauma in 2(0.60%) and stye 2(0.60%) children were found. (Table 2)

Out of 332 patients, there were 31 patients of refractive error which accounts to 9.33%. Out of 31 refractive error, 26 children

were of simple myopia which accounted to (83.87%) while among others, high myopia in 3(0.90%), compound myopic astigmatism in 1 (0.30%) and 1 hyperopia in 1(0.30%) children. (Table 3)

## DISCUSSION

This was a prospective cross-sectional study done among school children of Parsa. Out of 332 primary school children, 99 children had some form of ocular morbidity which accounts for 29.82%.

This study was similar to study done in Kathmandu by where 34.2% had some form of ocular disorders.<sup>6</sup> Our findings compare well with findings of studies done among comparable age group in Dhulikhel (10.08%)<sup>7</sup>, China (12.8%)<sup>8</sup>, Chile (15.8%)<sup>9</sup> and Delhi, India (7.4%).<sup>10</sup>

On the other hand, a study done in rural Tanzania using primary school children between 7 and 19 years of age did not find refractive error (1%) to be a significant problem.<sup>11</sup>

Refractive was the commonest cause of ocular morbidity accounting for 9.33%(31 out of 332 children). This is similar to the study done by Nepal et al<sup>12</sup> where refractive error accounts for 8.1% being the most common ocular morbidity in study population.

Myopia was the commonest form of refractive error. Out of 31 refractive error patients 26 children were of simple myopia which accounted to (83.87%). Among others, high myopia was found in 3 (0.90%), compound myopic astigmatism in 1(0.30%) and hyperopia children in 1 (0.30%) children. This was similar with the study done by Nepal et al<sup>12</sup> where myopia was the commonest refractive error (4.3%) followed by astigmatism (2.5%) and hypermetropia (1.3%).

Our study showed conjunctivitis in 27(8.13%), blepharitis in 5(1.5%) children which was comparable with a study done by Surinder Singh et al<sup>13</sup> where prevalence of conjunctivitis was 23.74% and blepharitis was 4.42%. Convergence insufficiency was seen in 17 children (5.12%) in our study, comparable with the study done by Rouse MW, et al<sup>14</sup> where 13% had convergence insufficiency. The prevalence of exodeviation 10 children (3.01%), vitamin A deficiency 5 children (1.50%), ocular trauma 2 patients (0.60%) and sty 2 children (0.60%) in our study which is similar to the study done by Nepal et al<sup>12</sup> where exodeviation accounted for 1.4%, vitamin a deficiency 0.36% and ocular trauma 0.54%.

## ACKNOWLEDGEMENT

I would like to express my gratitude towards whole team who accompanied me in this study from Nepal Eye Hospital Tripureshwar, Kathmandu. I would also like to thank school teachers and volunteers and organizers of the programme.

## CONCLUSION

This was a prospective cross-sectional descriptive study carried out in Parsa of Chitwan district of Nepal. Out of 332 primary school children, 99 children had some form of ocular morbidity which accounts for 29.82%. Refractive was the commonest

cause of ocular morbidity accounting for 9.33%(31 out of 332) children, with myopia being the commonest form of refractive error. Conjunctivitis was the second commonest cause of ocular morbidity among primary school children of Parsa in Chitwan, This study clearly depicts the need of periodic school screening of the children. However a larger district level primary school study has to be conducted in Chitwan to support these findings.

## REFERENCES

1. Resnikoff S et al. Global data on visual impairment in the year 2002. Bulletin of the world Health Organization 2004; 82(11):844–851.
2. Gilbert C, Foster A. Childhood blindness in the context of VISION 2020 the right to sight. Bulletin of the World Health Organization 2001;79:227–232.
3. Brilliant LB et al. Epidemiology of blindness in Nepal. Bulletin of the World Health Organization 1985; 63 (2): 375-386.
4. Upadhyay MP, Gurung BJ, Pillai KK, Nepal BP. Xerophthalmia among Nepalese Children. Am J Epidemiol 1985 Jan;121(1):71-7.
5. Pokharel GP, Negrel AD, Munoz SR, Ellwein LB. Refractive error study in children: results from Mechi Zone, Nepal. Am J Ophthalmol 2000; Apr;129(4):436-44.
6. Shrestha RK, Joshi MR, Ghising R, Pradhan P, Shakya S, Rizyal A. Ocular morbidity among children studying in Private Schools of Kathmandu valley. Nepal Med Col J 2006 Mar;8(1):43-6.
7. Sherpa D, Panta CR, Joshi N. Ocular morbidity among primary school children of Dhulikhel, Nepal, Nepalese journal of ophthalmology. Nep J Ophthalmol 2011;3(2):172-6.
8. Zhao J, Pan X, Sui R, Munoz SR, Sperduto RD, Ellwein LB. Refractive error study in children: results from Shunji District, China. Am J Ophthalmol 2000;129(4):427-35.
9. Maul E, Barroso S, Munoz SR, Sperduto RD, Ellwein LB. Refractive error study in children: results from La Florida, Chile. Am J Ophthalmol 2000;129(4):445-54.
10. Chaturvedi S, Agrawal OP. Pattern and distribution of ocular morbidity in primary school children of rural Delhi. Asia Pacific Journal of Public Health 1999;11(1):30–3.
11. Wedner SH1, Ross DA, Balira R, Kaji L, Foster A. Prevalence of eye diseases in primary school children in a rural area of Tanzania. Br J Ophthalmol 2000 Nov;84(11):1291-7.
12. Nepal BP1, Koirala S, Adhikary S, Sharma AK Ocular morbidity in schoolchildren in Kathmandu. Br J Ophthalmol 2003 May;87(5):531-4.
13. Singh S, Singh H, Joshi VS. Eye diseases among primary school children. Indian J Ophthalmol 1974 Sep;22(3):1-3.
14. Rouse MW et al. Frequency of convergence insufficiency among fifth and sixth graders. The Convergence Insufficiency and Reading Study(CIRS) group, Optom Vis Sci. 1999 Sep;76(9):643-9.