

## **Original Research Article**

### **A Cross Sectional Prevalence Survey of different Ocular Morbidity in School Children of Gwalior Chambal Region of MP**

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**Abstract:** The prevalence of blind children in India is surmounting with an estimated 320,000 blind children, higher than any other country in the world. Considering the fact that 30% of India's blind population loses their sight before the age of 20 years, the importance of early detection and treatment of ocular diseases and visual impairment in young is of high priority. The Aims and Objectives is to study the prevalence and pattern of ocular morbidity in school children, as well as to study treatable and non-treatable causes. The Materials and Methods is the data collection instrument was a pretested structured questionnaire. The preliminary examination of school children was done at the respective schools. Detailed history, including family history, about the current problems and past problem was recorded. Chi-square test was used to observe associations of ocular morbidity in respect to age, sex, treatable and non treatable diseases. Level of significance was assessed at 5%. In Results a cross-sectional study was conducted in 16 schools of Gwalior region involving 5000 children between the age group of 5-16 years. Prevalence of ocular morbidity in school going children was found to be 14.5%. Among 725 cases of ocular diseases, prevalence of refractive error was 5.52%, Vitamin A deficiency was 3.66%, conjunctivitis was 1.62%, squint was 0.86%, injury was 0.54%, blepharitis was 0.48%, chalazion 0.42%, styne was 0.42%, pterygium was 0.36%, corneal opacity was 0.26%, ptosis was 0.24%, developmental cataract was 0.08% and colour blindness was 0.04%. Refractive error (5.52%) was the most common cause of ocular morbidity in school going children followed by vitamin A deficiency (3.66%) and conjunctivitis (1.62%). Myopia was most common among refractive errors. Prevalence of ocular diseases were more common in the age group of 8-12 years(7.5%) followed by 12-16 years (4.46%) and 5-8 years age group(2.54%). In Conclusion the School going children's are at risk of getting eye problems ranging from just ocular morbidity to blindness. Some conditions such as refractive errors and cataract are treatable and vitamin A deficiency is largely preventable. Many ocular diseases have their origin in childhood and the morbidity may go unnoticed and adversely affect the child's performance in school and may also cause severe ocular disability in the later part of life. Effective methods of ocular screening in school children are useful in detecting correctable causes of decreased vision, especially refractive errors and in minimizing long-term visual disability.

**Keywords:** prevalence; ocular morbidity; school children; treatable and non-treatable disease.

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#### **INTRODUCTION**

Estimated prevalence of blind children in India is around 320000 which are more than any other country in the world [1]. Blindness in children's is important as visual loss can affect their growth, education and opportunities in employment. Also visual loss significantly led to poor quality of life of children along with their family. It is the fact that, in India, 30% of children who are blind, misses their sight before they reach the age of 20. Hence it becomes very important to detect the causes as early as possible and start the treatment [1].

Eye related health services in school are very important so that all children can be tested for disease like squint, refractive error, amblyopia etc. The present

study was done to study prevalence and pattern of ocular morbidity in school children and also to study treatable and non-treatable disease.

#### **MATERIAL AND METHOD**

A cross-sectional study was conducted in school children between the age group of five to sixteen years. School survey was carried out in 16 schools and total no. of 5000 children underwent comprehensive ocular examinations. The study was conducted in eight private and eight government schools from July 2013 to July 2014. Informed consent from the parents of students was obtained with the assistance of school heads through their class teachers. The purpose of study was informed and explained to the children. Children

not willing for eye examinations and with age <5 years and >16 years were excluded from study.

The data collection instrument was a pretested structured questionnaire. The preliminary examination of school children was done at the respective schools. Detailed history, including family history, about the current problems and past problem was recorded.

Various parameters used for examination were visual acuity, colour vision, convergence test, anterior segment examination, posterior segment examination. Materials used for above examination were Snellen's or 'E' chart, Jaeger's chart, Pinhole, Torch, Ishihara chart, direct ophthalmoscope. First we recorded visual acuity with bare eyes (unaided eye), pinhole, with glasses. Visual acuity recording was carried out on Snellen's or 'E' chart at a distance of 6 meters. Anterior segment was examined with torch light. Posterior segment was examined by direct ophthalmoscopy. Colour vision was tested on Ishihara chart. Convergence test and test for Squint were carried out. Fundus evaluation with dilated pupil was done when vision was not improved with pinhole.

Visual acuity of  $\leq 6/9$  and improving with pinhole was considered to be refractive error. Vitamin A deficiency was considered by observing Bitot's spot, conjunctival and corneal xerosis and night blindness. The history of night blindness was obtained from the child. Strabismus was diagnosed by recording corneal light reflex combined with extra ocular movements and cover -uncover tests. A probable diagnosis of amblyopia was made if the vision was <6/9, not improving with pin hole/correcting glasses and no organic lesion was detected after complete ocular examination. Chi-square test was used to observe

associations of ocular morbidity in respect to age, sex, treatable and no- treatable diseases. Level of significance was assessed at 5%.

## RESULTS

In present study, a total of 5000 children were surveyed in which males were 3528 (70.56%) and females were 1472 (29.44%). Out of these, 725 children were with some or the other eye problems. Among these 725 diseased children males were 60% and females were 40%. Males were more affected than females. The prevalence was significantly higher in males, as determined by chi-square test, ( $p < 0.001$ ). Further age-wise stratification revealed 127(2.54%) affected children were in the age group of 5-8 years, 375 (7.5%) children were in the >8-12 years of age group, and 223(4.46%) affected children were between 12-16 years of age. There is no significant difference in the prevalence among the private and government schools (14% and 15%), as determined by Fischer's exact test.

Maximum no. of diseased children belonged to 8-12 years of age group. The present survey demonstrated that refractive errors 276(38.06%) were the most common cause of ocular morbidity in school children followed by vitamin A deficiency 183(25.24%) and conjunctivitis 81(11.17%).

Further analysis of eye involvement showed that out of 725 diseased children, 683(94.18%) were treatable and 42(5.82%) were non treatable. Amongst the prevalence of different ocular diseases in the study population, the most common pattern of ocular disease was refractive error followed by vitamin A deficiency and conjunctivitis. The prevalence rate was 5.52%, 3.66% and 1.62% respectively (Table 1).

**Table 1: Prevalence of diseases amongst school going children**

Disease	Prevalence Of Disease (%)
Refractive error	5.52
Vitamin A deficiency	3.66
Conjunctivitis	1.62
Squint	0.86
Injury	0.54
Blepharitis	0.48
Chalazion	0.42
Stye	0.42
Pterygium	0.36
Corneal opacity	0.26
Ptosis	0.24
Developmental cataract	0.08
Colour blindness	0.04

## DISCUSSION

The prevalence of blindness in children ranges from approximately 0.3/1000 children in affluent regions to 1.5/1000 in the poorest communities [3]. Globally there are approximately 1.4 million blind children and almost three-quarter of them live in developing countries [3]. The major causes of childhood blindness are easy to detect and approximately 40% are preventable. School children are easy to access and can be reached more easily in comparison to general population [3].

The present study was conducted to find out the prevalence and pattern of ocular morbidity in school going children between July 2013 to July 2014. The study was conducted in 16 schools of Gwalior city involving 5000 children of 5-16 years age.

The gender distribution showed that out of 5000 children, males were 3528 (70.56%). Out of affected 725 children there were 435 (60%) males. The prevalence rate of ocular morbidity in males was 8.7%. Out of 1472 (29.44%) females screened, ocular involvement was seen in 290 girls. The prevalence rate of ocular morbidity in females was 5.8%. Hence, there was no difference in ocular morbidity between private (14%) and government school (15%) corroborating with the study results by Kumar R *et al.*; [12].

Further analysis of age wise distribution, it has been seen that in the present study the age group of > 8-12 years has maximum number of children with ocular diseases followed by > 12-16 years age group and least in the 5-8 years age group. Hence our observations are in similar lines with the findings of Logan *et al.*; Dandona *et al.*; [9, 11].

The most common eye disorder was refractive error 38.06% and in many of them it was undiagnosed, followed by symptoms suggestive of Vitamin A deficiency. These findings are in accordance with the finding of Chung *et al.*; Kalikivayi *et al.*; and various other previous workers [3, 4, 6, 7, 9, 11, 15, 16].

The treatable causes in the present study were refractive errors, vitamin A deficiency, conjunctivitis, squint, blepharitis, chalazion, pterygium, ptosis and developmental cataract. The prevalence of treatable diseases were 13.66% amongst school children, which is in accordance with Ajaiyeoba *et al.*; [13]. Similarly, non-treatable diseases were ocular injuries, corneal opacity and colour blindness. The present study however demonstrated a positive finding that the treatable diseases were more common in > 8-12 years age group in both males 191(47.4%) and females 165(58.9%). Hence our findings are in accordance with the findings observed by Ajaiyeoba *et al.*; [13].

Among the prevalence of various ocular morbidity, in present study out of 725 cases of ocular diseases, prevalence of refractive error, vitamin A deficiency, conjunctivitis were higher as compared to squint, injury, blepharitis, chalazion, stye, pterygium, corneal opacity, ptosis and colour which is in corroboration with the results observed by Kalikivayi *et al.*; who way back in 1997 showed prevalence of hyperopia was 22.6%, myopia 8.6% and astigmatism 10.3%. Children included amblyopia in 40 (1.1%), corneal diseases in 5 (0.1%), cataract in 2 (0.05%) and others in 4 (0.1%) [4].

Chaturvedi *et al.*; found trachoma (18%) as the most common ocular morbidity followed by vitamin A deficiency (10.6%), visual acuity < 6/9 (7.4%) and apparent/latent squint (7.4%) [5]. Similarly, a study by Nepal *et al.*; had found that refractive error was the commonest type of ocular morbidity (8.1%). Myopia was the commonest type of refractive error (4.3%) as opposed to hypermetropia (1.3%). 12.4% of children with refractive error had already developed amblyopia [10]. Strabismus is the second commonest type of ocular disability (1.6%).

Amruta *et al.*; found refractive errors (22.0%) as the major cause of ocular morbidity followed by squint (2.5%), colour blindness (2.3%), vitamin A deficiency (1.8%) and conjunctivitis (0.8%) which is similar to our results [16].

## CONCLUSION

A study of the pattern of ocular diseases in children is also important because some eye conditions may cause just ocular morbidity while others may lead to blindness. Some conditions such as refractive errors and cataract are treatable and vitamin A deficiency is largely preventable. Many ocular diseases have their origin in childhood and the morbidity may go unnoticed and adversely affect the child's performance in school and may also cause severe ocular disability in the later part of life. Effective methods of vision screening in school children are useful in detecting correctable causes of decreased vision, especially refractive errors and in minimizing long-term visual disability.

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