

OCULAR MORBIDITY AMONG SCHOOL CHILDREN OF AGE 12 AND ABOVE IN THE VILLUPURAM, DISTRICT OF TAMIL NADU

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Abstract

Background: Ocular morbidity includes both visual impairing and non-visual impairing conditions. The most common ocular morbidity conditions prevailing are refractive error, conjunctivitis, vitamin A deficiency, strabismus, eyelid infections, congenital anomalies and ocular trauma. The main purpose of this study is to estimate the proportion of ocular morbidity and to identify the various risk factors associated with ocular morbidity among school children of age 12 to 17 years. **Materials and Methods:** The study was a cross sectional descriptive study conducted in high schools and higher secondary schools in Villupuram district of Tamil Nadu. A multi-stage sampling technique was used to select 1000 school children of age 12 and above. Pretested semi-structured questionnaire were used. The collected data was analysed using the Microsoft Excel and SPSS software version 23.0. **Result:** The ocular disorders did not show any significant variation with boys and girls. There was no significant association of the eye diseases between the different age groups. Refractive errors, Conjunctivitis and Vitamin deficiency was found to be highly prevalent in the study group. **Conclusion:** Though most of the ocular morbidities prevailing in the students in the present study would not cause immediate blindness or serious ocular illness, it would hinder comfortable academic routine. Routine eye screening and examination are very essential part for the school children.

INTRODUCTION

“Globally 246 million are visually impaired. Among them 15 million blind people are from India out of which 2, 70,000 are children.”^[1-3] “Ocular disorders are the most common disabilities to affect visual acuity, thus causing learning disabilities in children and also affecting their personality and quality of life. Ocular morbidity is a spectrum of diseases which includes both visual impairing and non-visual impairing condition.

The visually impairing ocular morbidity is a major public health problem. The most common ocular morbidity conditions prevailing are Refractive errors, Conjunctivitis, Vitamin A Deficiency, Strabismus, Eyelid Infections, Congenital abnormality and Ocular Trauma.

MATERIALS AND METHODS

The present study is a cross sectional descriptive study conducted in high schools and higher

secondary schools in Villupuram district of Tamil Nadu. The data required for the study was collected during the eye camps conducted in the schools by the Department of Ophthalmology, Sri Manakula Vinayagar Medical College & Hospital, Puducherry. Institutional Ethics Committee approval was obtained and the study was conducted in full accord with the tenets of the Declaration of Helsinki.

Permission for conducting the study was obtained from the concerned management of the schools. Data collection was started after taking written consent from the study participants and their parent / guardian respectively. The study duration was 18 months from the date of approval of the proposal. A multi-stage sampling technique was used to select school children of age 12 and above from schools in Villupuram district. Ocular history and basic ocular examinations were carried out on the children included in the study.

Inclusion Criteria

- All school going children of age 12 to 17 years were included in this study.

- The children who were using spectacles and contact lenses were also included in this study.

Exclusion Criteria

- Children with multiple disabilities
- Absentees on the day of data collection or who did not bring consent from parent were excluded from the study.

The sample size was calculated based on estimated mean prevalence of 31%.^[4] “Allowable error was 10% with 10% excess sampling to account for non-response, the sample size derived was 979. Sample size was calculated using the formula:

$$N = \frac{4PQ}{d^2}$$

Multistage sampling method was used. First stage two blocks were selected from 14 blocks of Villupuram district. Second stage Government and government aided school from each block was selected by stratified sampling method. Four schools were selected. In the third stage all the students from seventh to twelfth standard in the selected schools were included in the study.

Pretested semi-structured questionnaire was developed based on previous review of literature.^[4] It consisted of socio demographic details of the individual and the family, parental and sibling history, chief complaints related to ocular morbidity, past medical history, spectacle or contact lens user and time spent in near work and outdoor activities. Informed and written consent was taken from the school principal / teacher / or the parent. The students were then interviewed with these questionnaires

Anthropometry was measured. Anterior segment examination was done with torch and hand held slit lamp. Visual acuity was measured using Snellen chart. Fundus examination was done by direct ophthalmoscopy and if required with indirect

ophthalmoscopy. Intraocular pressure was measured with noncontact tonometry

Extra ocular movements, cover tests, convergence test using RAF rule done to detect latent or manifest strabismus. Color vision was tested using Ishihara’s chart. Retinoscopy was done with cycloplegia in required cases and refractive error was corrected. Data analysis was done using the Microsoft Excel and SPSS software version 23.0.

RESULTS

In this present study, a total of one thousand (1000) school students of age 12 and above were examined. [Table 1] shows the age and gender wise distribution of study participants. The age range considered for the study group ranged from 12 to 17 years. Among the 1000 participants 49.4% were girls and 50.6% were boys. Majority of them were in 13 to 16 years (16% to 17%) The average age range is 13.933± 1.6633. The chi-square value is 4.892 and the respective p-value is 0.492.

The prevalence of various ocular morbidity conditions is shown in the [Table 2]. The total ocular morbidity conditions prevailing in this study were 49.2%. Refractive error was found to be most prevalent ocular morbidity. A total of 309 (30.9%) students had refractive error. Myopia was the most common (29.8%). 0.7% of students had Astigmatism and 0.4% had Hypermetropia. Conjunctivitis was found in 8% students next to refractive error. Allergic conjunctivitis was 4.8% more common than due to infection which was 3.2%. Vitamin A deficiency was also considerably high (4.7%) with Bitot’s spot being the common finding. Esotropia was more common than exotropia or amblyopia. About 1.4% of children had eyelid infections like chalazion or hordeolum. Congenital abnormality was found in to be less and ocular trauma was least prevalent.

Table 1: Age and gender wise distribution of study participants

Variables	No (n=1000)	Percentage %	Chi-square	p-value
AGE			4.892	0.492
12	157	15.7		
13	176	17.6		
14	179	17.9		
15	168	16.8		
16	174	17.4		
17	146	14.6		
SEX				
Male	506	50.6	0.144	0.70434
Female	494	49.4		

Table 2: Prevalence of Various Type of Ocular Morbidity among the Study Participants

Ocular	No (n = 1000)	Percentage %
Refractive Error	309	30.9
Myopia	298	29.8
Astigmatism	7	0.7
Hypermetropia	4	0.4
Conjunctivitis	80	8
Vitamin A Deficiency	47	4.7
Strabismus	29	2.9
Eyelid Infections	14	1.4

Chalazion	5	0.5
Hordeolum	9	0.9
Congenital Abnormality	7	0.7
Color Blindness	1	0.1
Congenital Cataract	3	0.3
Congenital Ptosis	3	0.3
Ocular Trauma	6	0.6
Corneal Opacity	4	0.4
Traumatic Cataract	2	0.2
Total	492	49.2

In the study it was found ocular morbidity was more prevalent in boys than girls [Table 3] which was statistically significant. Only Vitamin A Deficiency was more prevalent in girls than boys

Table 3: Gender wise distribution of prevalence of ocular morbidity

Ocular morbidity	Boys		Girls		P value
	N	%	N	%	
Refractive error					
Myopia	154	15.4%	144	14.4%	0.5624
Hypermetropia	5	0.5%	2	0.2%	0.2468
Astigmatism	3	0.3%	1	0.1%	0.3173
Conjunctivitis	45	2.25%	35	1.75%	0.4262
Vitamin deficiency	19	1.9%	27	2.7%	0.2382
Strabismus	15	1.5%	14	1.4%	0.6547
Eyelid infections	8	0.8%	6	0.6%	0.6564
Congenital abnormality	5	0.5%	2	0.1%	0.563

DISCUSSION

In this present study, a total of 1000 school students of age 12 and above were examined. Among the 1000 participants, 49.4% were girls and 50.6% were boys. The majority of the parents of the participants were literates.

The prevalence of ocular morbidity in this study was found to be 49.2% out of which 25.8% of boys and 23.4% of girls had ocular disorders. 23.2% of the boys and girls below the age group of 15 and 26% above the age group of 15 were found with various ocular morbidities. "Previous studies have showed varied prevalence in different region. Similar study by Chaturvedi,^[6] and Aggarwal 5 had 40% ocular morbidity conditions". "Similarly, Gupta et al 4 findings in Shimla school going children was 31.6%, But the study by Kumar et al in Delhi and Singh et al in West Uttar Pradesh findings had reported less prevalence with 22.7% and 29.35% respectively."^[7-9] "However higher prevalence has been reported from the states like Haryana (58.8%), Rajasthan (71.7%) and Punjab (64.25%)."^[10-14] This could be because of the higher prevalence of certain conditions like trachoma in these states.

"When compared with international studies prevalence of ocular morbidity was 34.2% in study by Shrestha et al in Kathmandu schools and 18.36% by Lu et al in Tibet".^[9,10] This difference can be explained due to different characteristic of study like the age group, race and living conditions.

Refractive error was the most prevalent ocular disorder in our study (30.9%) and among this Myopia was found to be more common. "This was comparable to study by Gupta et al,^[4] and Sonam Sethi et al.^[11] This could be because of inclusion of cycloplegic refraction in the methodology of study

and higher number of study participants. Higher prevalence of Conjunctivitis was found in our study (8%) with allergy and infection being the common etiology. It could be because of poor personal hygiene as most children belonged to lower socioeconomic status. The prevalence of Vitamin A deficiency was 4.7% and especially in girls. "This data correlates Toteja et al,^[12] and recent study by Aggarwal et al. Poor intake and unhealthy dietary pattern was found to be the cause from history. Strabismus, eyelid infections and congenital anomalies was found to be less common. Similarly trauma was also least common.

CONCLUSION

In this study we were able to collect data related to conditions causing ocular morbidities using school screening programme. We found that refractive errors and Vitamin deficiency were more prevalent. Though most of the ocular morbidities prevailing in the students in the present study would not cause immediate blindness or serious ocular illness, it would hinder comfortable academic routine. This study strongly suggests the need for regular school screening In the present digital era, not only the school children the majority of the populations are addicted to electronic gadgets which even worsen up the eye conditions year by year. State health department can take measures to regularly screen school children and improve treatment programs like Vitamin A supplementation based on consolidated data like that of our study. Limitation of our study is that it did not provide details of children from urban and rural area which could have been an added value.

REFERENCES

1. World Health Organisation. Blindness and deafness unit and international agency for the prevention of blindness. (2000). Preventing blindness in children: Report of a WHO/IAPB scientific meeting. Hyderabad, India, 13-17 April 1999. World Health Organisation. Available from: <http://apps.who.int/iris/handle/10665/66663>
2. World Health Organisation. Blindness and deafness unit and WHO program for the prevention of blindness. (2000). Elimination of avoidable visual disability due to refractive errors: Report of an informal planning meeting Geneva, 3-5 July 2000. World Health Organisation. Available from: <http://apps.who.int/iris/handle/10665/666639>.
3. School eye screening and the National Program for Control of Blindness-R Jose, Sandeep Sachdeva, Directorate General of Health Services, Ministry of Health and Family Welfare, Nirman Bhawan, New Delhi. Indian Pediatrics. Page 205-208 Volume 46_March 17, 2009
4. Gupta M, Gupta, B. P, Chauhan, A. and Bhardwaj, A (2009) Ocular Morbidity Prevalence among School Children in Shimla, Himachal Pradesh, Indian Journal of Ophthalmology, 57(2), 133-138
5. Agrawal, Deepanshu; Sahu, Anupam1.; Agrawal, Deepshikha2 Prevalence of ocular morbidities among school children in Raipur district, India Indian Journal of Ophthalmology: February 2020 - Volume 68 - Issue 2 - p 340-344 doi: 10.4103/ijo.IJO_1454_1
6. Chaturvedi S. and Aggarwal O.P (1999) Pattern and Distribution of Ocular Morbidity in Primary School Children of Rural Delhi. Asia-Pacific J Public Health Asia-Pacific Academy of Consort Public Health. 1999; 11(1): 30-33.
7. Uzma N, Kumar BS, Khaja Mohinuddin Salar BM, Zafar MA, Reddy VD (2009) A comparative clinical survey of the prevalence of refractive errors and eye diseases in urban and rural school children. Can J Ophthalmol. 2009 Jun;44(3):328-33. doi: 10.3129/ij09-030
8. Veer Singh, Malik K.P.S, Malik V.K. and Kirti Jain (2018) Response to Comment on "Prevalence of Ocular Morbidity in School Going Children in West Uttar Pradesh" Indian J Ophthalmol. 2018 Jan; 66(1):180. doi: 10.4103/ijo.IJO_872_17. PMID: 19491992.
9. Shrestha R.K, Joshi M.R, Ghising R, Pradhan P, Shakya S. and Rizyal A (2006) Ocular Morbidity among Children Studying in Private Schools of Kathmandu Valley: A Prospective Cross Sectional Study. Nepal Med Coll J. 2006; 8(1): 43-6.
10. Lu P, Chen X, Zhang W, Chen S, Shu L (2008) Prevalence of ocular disease in Tibetan primary school children. Can J Ophthalmol. Feb;43(1):95-9. doi: 10.3129/ij07-194. PMID: 18204497.
11. Sonam Sethi and Kartha GP (2010) Prevalence of refractive errors in school children (12-17 Years) of Ahmedabad City. Indian J. Community Medicine. 4(25), 16-20.
12. Toteja GS, Singh P, Dhillon BS, Saxena BN (2002) Vitamin A deficiency disorders in 16 districts of India. Indian J Pediatr. 2002;69(7):603-605. doi: 10.1007/s12032-002-0070-1
13. Khurana AK SK, Parmar IPS, Aggarwal SK. Ocular morbidity among school children in Rohtak city. Indian J Public Health. 1984;28:217-20
14. Desai S, Desai R, Desai NC, Lohiya S, Bhargava G, Kumar K. School eye health appraisal. Indian J Ophthalmol 1989;37(4):173-5.
15. Singh S, Singh H, Joshi VS. Eye diseases among primary school children. Indian J Ophthalmol 1974;22:1-3