

Prevalence of Refractive Error in Semi Urban School Children



Medical Science

KEYWORDS : Prevalence, refractive error, myopia, blindness

**Dr. M.Meera Alias
Devasena**

Senior Resident Department of Ophthalmology, Sri Ramachandra Medical College & Research Institute Sri Ramachandra University Porur, Chennai-600 116.

ABSTRACT

Introduction:

About 153 million people above 5 years of age are visually impaired due to uncorrected refractive errors. Poor vision due to refractive error affects children learning in schools considerably. Myopia is the most common refractive error in children. The main aim of this study is to gather information about the prevalence of Refractive Error in semi urban school children aged 5-16 years.

Materials and Methods:

This Cross Sectional Study was done in school children aged 5-16 years. All children from class 1 to class 10 in a semi urban higher secondary school were included in the study. Visual acuity less than 6/9 in one or both eyes was classified as visually impaired. The sample size was calculated by the prevalence of Refractive error as 20% with an alpha error of 5% and relative precision 20%. Data entry and analysis were done by SPSS 15.0 software .

Results:

This cross sectional study was done among 430 school children aged 5- 16 years of semi urban School children aged 5-16 years. Out of which 218 (50.7%) were male children and 212 (49.3%) were females. The prevalence of refractive error in males was 10.7% (46) and 9.8% (42) in females. The overall prevalence of refractive error was found to be 20.5% with 95% confidence interval 16.7% to 24.3%. Among the type of refractive errors, the commonest one is simple Myopia (79.6%) followed by simple myopic astigmatism (13.6%) and 6.1% had simple hypermetropia.

Conclusion:

Prevalence is on the higher side due to over use of electronic gadgets by school children. Parents as well as school teachers should be educated about the signs and symptoms of uncorrected refractive errors. Routine school health screening for refractive errors is very essential for prevention of this cause of avoidable Childhood Blindness.

INTRODUCTION

About 153 million people above 5 years of age are visually impaired due to uncorrected refractive errors. Approximately 12.8 million children in the age group 5-15 years are visually impaired.¹ Poor vision due to refractive error affects children learning in schools considerably.² The National survey on blindness showed that 7% of children aged 10-14 years have eyesight problems.³ The World Health Organization launched Vision 2020 to eliminate avoidable blindness, uncorrected refractive errors being one of its major causes.⁴ Myopia is the most common refractive error in children. High Myopia is associated with peripheral retinal degenerations and detachment, macular degeneration leading to permanent blindness.⁵ The main aim of this study is to gather information about the prevalence of Refractive Error in semi urban school children aged 5-16 years for the prevention of blindness by early detection and correction for the same.

AIM

To estimate the prevalence of Refractive Error in semi urban school children aged 5-15 years

MATERIALS AND METHODS

This Cross Sectional Study was done in school children aged 5-16 years. All children from class 1 to class 10 in a semi urban higher secondary school were included in the study. After getting permission from school principal and consent from the parents, the unaided visual acuity of each child is assessed with snellen's chart at 6 meters (20 feet) distance by Ophthalmic Assistants. Visual acuity less than 6/9 in one or both eyes was classified as visually impaired and referred to Ophthalmologists in our Institution to rule out organic problems like squint, media opacities and retinal pathologies. Cycloplegic refraction done for all the children and subjective refraction was done in the next week and best glasses prescribed.

The sample size was calculated by the prevalence of Refractive error as 20% with an alpha error of 5% and relative precision 20%. The required sample size was found to be 385, since the number of children in the school was 430, all the children were selected for the study. Data entry and analysis were done by

SPSS 15.0 software. Prevalence of refractive error, 95% confidence interval and Chi square were calculated.

RESULTS

This cross sectional study was done among 430 school children aged 5- 16 years of semi urban population out of which 218 (50.7%) were male children and 212 (49.3%) were females. The majority of them were in the age group 8-10 years which was about 124 (28.8%) followed by age group 11-13 years and were 109 (25.3%). The least proportion of study children were in the age group 14-16 years who were about 98 (22.8%). Among the 218 (50.7%) male students, 16 (14.2%) were in 8-10 years of age followed by 57 (13.3%) in 11-13 years. Among the 212 (49.3%) female students, 63 (11.9%) were in 8-10 years of age. The least proportion of males were in the age group 5-7 years (11.1%) whereas the least proportion of females were in the age group 14-16 years (10.7%) detailed tabulation in table:1

The prevalence of refractive error in males was 10.7% (46) and 9.8% (42) in females. The prevalence of refractive error was higher in males but not statistically significant. Among males, the prevalence of refractive error was highest in the age group 11-13 years to the extent of 32.6% whereas in females it was highest in the age group 8-10 years to the extent of 33.3%. The prevalence of refractive error was lowest in 5-7 years age group in both males and females. Details in table:2

The overall prevalence of refractive error was found to be 20.5% with 95% confidence interval 16.7% to 24.3%. Among the type of refractive errors, the commonest one is simple Myopia (79.6%) followed by simple myopic astigmatism (13.6%) and 6.1% had simple hypermetropia. About 40.9% (36) males and 38.6% (34) females were myopic and around 8% (7) male children and 5.7% (5) female children had Astigmatism respectively. Detailed tabulation in table:3.

DISCUSSION

The prevalence of refractive error was found to be 20.5% with 95% confidence interval 16.7% to 24.3%. The prevalence of refractive error in the present study was high compared to the

prevalence observed by GVS Murthy et al in New Delhi (6.4%),⁷ Kumar et al in Lucknow (7.4%),⁸ Seema s et al in Haryana (13.65%).⁹ The prevalence of refractive error from different parts of the world showed prevalence of 8.2% Baltimore (USA)¹⁰, 12.8% in Shungi district in China¹¹. The prevalence varied from place to place due to difference in demographic factors influenced by viewing television for long hours, playing smart phone games and prolonged use of computers and reduced outdoor activities in school going population.

In the present study, the prevalence of refractive error among male children was 10.7% and females 9.8%. Similar results were observed as compared to the following studies of Pokharel et al,¹² Tay MT et al¹³ and Seema Sharma et al.¹⁴ However the prevalence of refractive error by age and sex were not statistically significant. In our study Myopia is the commonest refractive error as seen in other studies which is nothing but short sightedness that is getting difficulty for distant vision and corrected by concave spherical lenses. The next common refractive error is Astigmatism requiring correction with cylindrical lenses. And the least common is Hypermetropia which is long sightedness and corrected with convex spherical lenses.

CONCLUSION

The present study showed that most of the children and parents are still unaware about refractive errors, one of the causes of avoidable blindness. Prevalence is on the higher side due to over use of electronic gadgets by school children. Parents as well as school teachers should be educated about the signs and symptoms of uncorrected refractive errors like complaints of headache, children engaging themselves more in near work, watching television closely, not showing interest in classroom activities etc. Routine school health screening for refractive errors is thus very essential for prevention of this cause of avoidable Childhood Blindness.

TABLE NO. 1 DISTRIBUTION BY AGE AND SEX

Age in years	Males	Females	Total
5 - 7	48	51	99
8 - 10	61	63	124
11 - 13	57	52	109
14 - 16	52	46	98
Total	218	212	430

TABLE NO. 2 PREVALENCE OF REFRACTIVE ERROR BY AGE AND SEX

Age in years	Refractive error in males			Refractive error in females		
	Yes	No	Total	Yes	No	Total
5 - 7	7	41	48	6	45	51
8 - 10	12	49	61	14	49	63
11 - 13	15	42	57	12	40	52
14 - 16	12	40	52	10	36	46
Total	46	172	218	42	170	212

TABLE 3 TYPES OF REFRACTIVE ERRORS

Type of Refractive Error	Males	Females	Total	Percentage
Myopia	36	34	70	79.6%
Astigmatism	7	5	12	13.6%
Hypermetropia	3	3	6	6.8%
TOTAL	46	42	88	100%

REFERENCE

- Dandona R, Dandona L. Refractive error blindness. Bull World Health Organ. 2001;79:237-243 | 2.Negrel AD, Maul E, Pokharel GP, Zhao J, Ellwein LB. Refractive error study in children; sampling and measurement methods for a multicountry survey. Am J Ophthalmol 2000;129:421-426 | 3.Prajapati P, Oza J, Prajapati J, Kedia G, Chudasama RK. Prevalence of Ocular Morbidity among school adolescents of Gandhinagar district, Gujarat. <http://www.ojhas.org/issue36/2010-4-5> | 4.World Health Organization , Global initiative for the elimination of avoidable blindness. Programme for the prevention of blindness and deafness, Geneva: WHO, 1997 | 5.Eibenan S et al. validation study of the New York State Optometric Association (NYSOA) vision screening battery. American journal of Optometry 1985;62(3):165-8 | 6. Govt. of India | (2004), Annual Report 2003-2004, Ministry of Health and Family Welfare, New Delhi, 2005. | 7. Murthy GV, Gupta SK, Ellwein LB, Muñoz SR, Pokharel GP, Sanga L, et al. | Refractive error in children in an urban population in New Delhi. Invest Ophthalmol Vis Sci. 2002;43:623-631 | | 8. Kumar JV, Singh PC, Ahuja J, Mohan U. Ocular | morbidity among school children in Sarojini Nagar Lucknow. Indian J Community Med. 1992;17:109-113. | | 9. Sharma S, Vashisht BM, Kalhan M, Goel M. Magnitude | of Refractive Errors among school children in a rural block of Haryana. The Internet Journal of Epidemiology. 2009;6(2). DOI: 10.5580/1e5f | | 10. Proslan M, Novak | C. The Baltimore vision screening project. Trop Med Int Health. 1996;3:14-319. | | 11. Zhao J, Pan X, Sui R et al. Refractive error study in Children: results from Shunyi | District, China. American J Ophthalmol. 2000;129:427-35. | | 12. Pokharel GP, Negrel AD, Munoz SR et al.Refractive error studies in Children: Results from mechi | Zone, Nepal. American J Ophthalmol. 2000; 129:436-44. | | 13. Tay MT, Au Fong KG, Ng CY, Lim MK. Myopic & educational attainment in 421116 young Singaporean | males. Ann Acad Med, Singapore. 1992;21:785-91. | 14.Seema S, Vashisht B, Meenakshi K and Manish G (2009) Magnitude of Refractive errors among school children in a rural block of Haryana. The Internet J.Epidemiol. 2(6), 21-24