

Original Research

Evaluation of profile of newly detected refractive errors among school going children

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ABSTRACT:

Background: The present study was conducted for evaluating the profile of newly detected refractive errors among school going children. **Materials & methods:** A total of 200 school going children within the age range of 6 to 14 years were recruited for the present study. Demographic indices including age, sex, address and socio-economic status were recorded. Relevant personal and family history was taken. Unaided visual acuity of all children was measured with the help of Snellen chart. On the basis of unaided visual acuity, visual impairment was graded as mild (VA 6/6 to 6/12), moderate (VA 6/18 to 6/36) and severe (VA 6/60 to less than 6/60). Refractive errors were classified according to the standard definitions as myopia, hypermetropia and astigmatism. **Results:** Higher education of parents was associated with presence of refractive error in child and this was statistically significant. Visual acuity at the time of presentation was better than 6/12 in 46% of eyes, 6/18 to 6/36 in 34% and $\leq 6/60$ in 20% of the eyes. Hence, most of the children had mild to moderate visual impairment in the present study. In the current study the most common type of refractive error was astigmatism (37%), followed by myopia (34%) and hypermetropia (24%). **Conclusion:** Higher education of parents was significantly associated with the presence of refractive error in child. Most of the children with refractive error present with mild to moderate decrease in visual acuity ($\leq 6/36$). Astigmatism was the most common type of refractive error followed by myopia and hypermetropia.

Key words: Refractive errors, Children

Received: 16 January, 2022

Accepted: 21 February, 2022

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This article may be cited as: Gupta E, Chauhan SS, Gulati V, Parmar P. Evaluation of profile of newly detected refractive errors among school going children. *Int J Res Health Allied Sci* 2022; 8(2):155-157.

INTRODUCTION

Childhood visual impairment due to uncorrected refractive errors is a significant problem among schoolgoing children. In children, visual impairment due to uncorrected refractive errors can have an adverse effect on education, personality development, career opportunities, etc., in addition to the enormous socioeconomic burden on the society. Early correction of refractive errors results in reduction of number of children with visual impairment and amblyopia. Many children with uncorrected refractive errors may be asymptomatic, hence active screening aids in early detection and timely intervention. Although school screening programs are conducted in every nook and corner of the country, accurate data on the current prevalence of childhood visual impairment is still lacking.¹⁻³

Refractive error as a cause of blindness has not received much attention because many definitions of blindness have been based on best-corrected distance visual acuity, including the definition used in the International Statistical Classification of Diseases and Related Health Problems. Because of the increasing realization of the enormous need for correction of refractive error worldwide, this condition has been considered one of the priorities of the recently launched global initiative for the elimination of avoidable blindness: Vision 2020 - The Right to Sight. In India, the overall incidence of refractive errors has been found to vary between 21% and 25% of the patients attending eye outpatient department.³⁻⁶ Hence; the present study was conducted for evaluating the profile of newly detected refractive errors among school going children.

MATERIALS & METHODS

The present study was conducted for evaluating the profile of newly detected refractive errors among school going children. A total of 200 school going children within the age range of 6 to 14 years were recruited for the present study. Demographic indices including age, sex, address and socio-economic status were recorded. Relevant personal and family history was taken. Unaided visual acuity of all children was measured with the help of Snellen chart. On the basis of unaided visual acuity, visual impairment was graded as mild (VA 6/6 to 6/12), moderate (VA 6/18 to 6/36) and severe (VA 6/60 to less than 6/60). Refractive errors were classified according to the standard definitions as myopia, hypermetropia and astigmatism. All the results were recorded and analysed using SPSS software. Chi-square test was used for evaluation of level of significance.

RESULTS

A total of 200 school going children were evaluated. Out of these 200 children, 3 children had unilateral refractive errors. There were 121 boys and 79 girls. Mean age of children was 11.5 years. The study demonstrated that 40 percent mothers and 52 percent fathers were graduate and above. A total of 226 (57.07%) mothers and 278 (70.20%) fathers were intermediate and above. Higher education of parents was associated with presence of refractive error in child and this was statistically significant. Visual acuity at the time of presentation was better than 6/12 in 46% of eyes, 6/18 to 6/36 in 34% and $\leq 6/60$ in 20% of the eyes. Hence, most of the children had mild to moderate visual impairment in the present study. In the current study the most common type of refractive error was astigmatism (37%), followed by myopia (34%) and hypermetropia (24%).

Table 1: Distribution of eyes on the basis of presenting visual acuity

| Visual acuity | Right eye | Left eye | Total |
|------------------------|-----------|----------|-------|
| 6/6 to 6/12 | 48 | 44 | 92 |
| 6/18 to 6/36 | 36 | 32 | 68 |
| 6/60 to less than 6/60 | 18 | 22 | 40 |
| Total | 102 | 98 | 200 |

Table 2: Distribution of eyes on the basis of type refractive errors

| Type of refractive errors | Right eye | Left eye | Total |
|---------------------------|-----------|----------|-------|
| Myopia | 35 | 33 | 68 |
| Hypermetropia | 28 | 20 | 48 |
| Astigmatism | 39 | 35 | 74 |
| Total | 102 | 98 | 200 |

DISCUSSION

Combating childhood vision impairment (VI) and blindness is one of the important goals of the World Health Organization's (WHO) VISION-2020-The Right to Sight strategy. As per the latest estimates, there are about 1.14 million children who are blind and 19 million visually impaired globally. These estimates are mostly based on studies carried out in schools for the blind, a few population-based studies, and some also based on the under 5 mortality rate (U5MR). However, it is difficult to generalize the estimates from schools for the blind to the population level as it is not a valid representation of the population. There have been several studies carried out in different parts of the world to estimate the prevalence of VI among children using the key informant method.³⁻⁶

Refractive error is an optical defect intrinsic to the eye which prevents light from being brought to a single point focus on the retina, thus reducing the normal vision. It is the second largest cause of impaired vision after cataract. The impact of refractive errors on the individual and on the community cannot be ignored. Hence there is a need to plan future strategies and implement appropriate measures for early diagnosis and treatment of refractive errors.⁷⁻¹⁰ Hence; the present study was

conducted for evaluating the profile of newly detected refractive errors among school going children.

A total of 200 school going children were evaluated. Out of these 200 children, 3 children had unilateral refractive errors. There were 121 boys and 79 girls. Mean age of children was 11.5 years. The study demonstrated that 40 percent mothers and 52 percent fathers were graduate and above. A total of 226 (57.07%) mothers and 278 (70.20%) fathers were intermediate and above. Higher education of parents was associated with presence of refractive error in child and this was statistically significant. Saha M et al assessed the prevalence of refractive errors, among school children in the age group of 5-15 years. The study was a cross-sectional study comprising 1840 government school children in the age group of 5-15 years in the Outpatients Department of R. G. Kar Medical College, after screening. Students were screened for defective vision with the help of Snellen's chart. Students with refractive errors underwent retinoscopy under cycloplegia followed by post mydriatic test. Corrective glasses were prescribed and provided free of cost. A total of 1840 children were examined. Of which 53.6% of the study population were boys and 46.4% were girls. The mean age of the study group was 12.4 years.

48.5% of the children were in the age group of 13-15 years. 44.4% of the refractive error was detected in children studying in class 8, 9, and 10. The prevalence of refractive error in our study population was 13.86%. Urban and rural children were 7.03%. Myopia was noted to be the most common refractive error followed by hypermetropia and astigmatism. It was also noted in our study that the prevalence of refractive error was more common in the female children. It was also noted that there was a relationship between family history of parents or siblings having refractive errors. The prevalence of uncorrected refractive error, especially myopia, was higher in older children.¹¹

Visual acuity at the time of presentation was better than 6/12 in 46% of eyes, 6/18 to 6/36 in 34% and $\leq 6/60$ in 20% of the eyes. Hence, most of the children had mild to moderate visual impairment in the present study. In the current study the most common type of refractive error was astigmatism (37%), followed by myopia (34%) and hypermetropia (24%). Adhikari S et al assessed the magnitude and determinants of refractive error among school children of Lalitpur and Bhaktapur districts in Kathmandu Valley of Nepal. A descriptive study was carried out in four schools; two in each district. A detailed ocular examination was conducted of all children attending these schools and that included visual acuity testing, slit lamp examination, fundus evaluation, retinoscopy, cycloplegic refraction and subjective refraction. Myopia was defined as more than -0.5 D and hypermetropia was defined as error of more than $+1$ D. A total of 2000 students of 5-16 years of age were examined. The prevalence of refractive error was 8.60% (95% confidence interval [CI] 7.37-9.83). The prevalence of myopia was 6.85% (95% CI 5.74-7.96). The best-corrected visual acuity was 6/9 or less in the eye of 12.8% children with refractive error. Refractive error is of public health magnitude among school children of 14-16 years of age.¹²

CONCLUSION

Higher education of parents was significantly associated with the presence of refractive error in child. Most of the children with refractive error present with mild to moderate decrease in visual acuity ($\leq 6/36$). Astigmatism was the most common type of refractive error followed by myopia and hypermetropia.

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