PATTERN OF REFRACTIVE ERRORS IN SCHOOL CHILDREN IN RURAL TOWN OF BAREILLY DISTRICTManu Bansal¹¹Assistant Professor, Department of Ophthalmology, Rajshree Medical Research Institute.**ABSTRACT****BACKGROUND**

The aim of this study is to assess the pattern of refractive errors in school children in rural town of Bareilly district.

MATERIALS AND METHODS

All the primary school children of rural town attending the eye OPD of Rajshree Medical Research Institute from January 2016 to June 2016, under school screening were included in the study. The students underwent a preliminary ocular examination. All the children with defective vision (VA < 6/9) were selected for detailed ocular examination including VA both for distance and near, objective refraction with auto refractometer followed by streak retinoscopy under cyclopentolate 1% eye drop, anterior segment and fundus examination. The children with any type of refractive errors on post-mydratic examination were further evaluated according to the type of refractive error.

Statistical Analysis - Chi square test.

RESULTS

Prevalence of refractive error was 13%. The most common refractive error was astigmatism followed by myopia.

CONCLUSION

There is a need to do regular vision screening in school children as refractive error is an important cause of treatable blindness.

KEYWORDS

Refractive Errors, Myopia, Hypermetropia, Astigmatism, Screening.

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BACKGROUND

The World Health Organisation (WHO) has grouped uncorrected RE among the leading causes of blindness and visual impairment in the world.¹ Childhood blindness is considered as one of the priorities in Vision 2020 - Right to sight. It is estimated that there are 1.4 million blind children in the world, two-thirds of whom live in developing countries and of all these children it is estimated that 2,70,000 live in India. About 80% of this is avoidable blindness, although a large number of those affected remain blind due to lack of appropriate access to eye care.²

During the last decade, studies confirmed that the prevalence of uncorrected refractive errors is high for children in low and middle income countries and have extensive social and economic impacts, such as limiting educational and employment opportunities of economically active persons, healthy individuals and communities.³ Uncorrected refractive error may have larger impact on the learning capability and potential of school children.

Timely detection and intervention can improve a child's potential tremendously during the formative years.⁴ For India to continue to reap the benefits of the ongoing demographic transition, it is vital that the younger population need to be physically healthy and the country needs to address the health issues urgently.

MATERIALS AND METHODS

The present study was a descriptive cross-sectional study. Ethical clearance was taken from the Institutional Review Board. All the primary school children of rural town attending the eye OPD of Rajshree Medical Research Institute, Bareilly (U.P.) from January 2016 to June 2016, under school screening were included in the study. A detailed history was taken from all the students including family history, current problems, past problems and treatment. The students then underwent a preliminary ocular examination. An internally illuminated Snellen's chart was used at 6 metre distance for assessment of uncorrected, presenting and best corrected Visual Acuity (VA). Extraocular movements and cover test were performed using torch light and convergence was tested. All the children with defective vision (VA < 6/9) were selected for detailed ocular examination including VA both for distance and near, objective refraction with auto refractometer followed by streak retinoscopy under cyclopentolate 1% eye drop, anterior segment and fundus examination. The parents of all children were informed about the nature of the study and consent was obtained. The students with history of prior ocular surgery or any ocular disease contributing to the diminished VA, manifest strabismus and pathological myopia were excluded from the study.

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Corresponding Author:

Dr. Manu Bansal,

#6, Brijloy Colony,

Near Sood Dharm Kata,

Prem Nagar,

Bareilly-243005,

Uttar Pradesh.

E-mail: docmanubansal@gmail.com

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The children with any type of refractive errors on post mydriatic examination were further evaluated according to the type of refractive error.

A spherical equivalent of -0.5 diopter (D) or more was defined as myopia, +1D or more was defined as hypermetropia, and a cylinder refraction greater than 0.75D was considered as astigmatism.

RESULTS

A total of 1242 children between 5 and 16 years of age were included in the study. Out of these 662 (53.3%) were male and 580 (46.7%) were female. The children were divided into 4 groups according to their age (Table 2). Unaided VA worse than 6/9 was present in 162 children, i.e. 13% of total children (Table 1).

Sex	Total (N)	Cases with Refractive Error	Percentage among Sex Distribution
Males	662 (53.3%)	90	13.6%
Females	580 (46.7%)	72	12.4%

Table 1. Sex Distribution of Children

Age (Years)	Total (N)	Percentage in Study Group	Cases with Refractive Error among Age Groups	Percentage Distribution among Age Groups
5 - 7	181	14.6%	17	9.4
8 - 10	270	21.7%	30	11.1
11 - 13	339	27.2%	45	13.3
14 - 16	452	36.4%	70	15.5

Table 2. Distribution of Children by Age

In the study maximum children were in 14 to 16 years of age, among them 15.5% of children had refractive error. Among 5 - 7 years of age, 9.4% of children had refractive error (Table 2).

Refractive Errors	Total	Percentage among Cases
Myopia	65	40.1
Hypermetropia	12	7.4
Astigmatism	85	52.5

Table 3. Refractive Error Distribution

Among the cases maximum had astigmatism, i.e. 52.5%, myopia was present in 40.1% and hypermetropia was present in 7.4% of cases.

Age Distribution (Years)	Myopia (65)	Hypermetropia (12)	Astigmatism (85)
5 - 7	6 (9.2%)	6 (50%)	30 (35.3%)
8 - 10	12 (18.5%)	3 (25%)	22 (25.9%)
11 - 13	17 (26.1%)	2 (16.7%)	19 (22.4%)
14 - 16	30 (46.2%)	1 (8.3%)	14 (16.5%)

Table 4. Refractive Errors Distribution in Age Groups

The prevalence of myopia progressively increases from 9.2% in 5 - 7 years to 46.2% in 14 - 16 years. Prevalence of

hypermetropia and astigmatism decreases from 5 - 7 years to 14 - 16 years. This was statistically significant ($P < 0.05$).

DISCUSSION

Childhood blindness is a priority area because of the number of years of blindness that ensues. Data on the prevalence and causes of blindness in children is needed for planning and evaluating preventive and curative services for children. The prevalence of refractive error in this study was 13%, which was similar to prevalence observed by Seema et al of 13.65%.⁵ Prevalence reported by GVS Murthy⁶ et al was 6.4% and Kumar et al⁷ was 7.4%.

There was an increase in the overall prevalence of refractive errors with advancing age as shown in Table 2. Our results were comparable with the study by Pavithra et al⁴ and Matta S et al⁸ showing increasing prevalence with age.

In our study, astigmatism was the most common refractive error followed by myopia and then hypermetropia (Table 3). This is comparable with the study of Rai et al.⁹ Pavithra et al⁴ and Matta S et al⁸ observed myopia to be the most common refractive error. Medi et al¹⁰ showed commonest refractive error was astigmatism (52%) followed by hypermetropia (37%) and least common was myopia (11%). In the present study myopia showed an increasing trend with advancing age and hypermetropia and astigmatism showed a decreasing trend with advancing age, which was statistically significant ($p < 0.05$). Similar pattern was shown by GVS Murthy et al⁶ and Pavithra et al⁴ in their studies.

A major limitation of our study was that only school going children were included in the study. Significant proportion of children in rural area do not go to school, hence a complete assessment of visual impairment in children was not possible.

CONCLUSION

Our collection of data and also the recommendations of other studies support the fact that regular vision screening of school children in India will be very useful in early detection and correction of avoidable problems. This study also supports the studies conducted in other areas that the school age is a high risk group for refractive errors. Children are not aware of their problems and the prevalence of undetected refractive error is high. As recommended in the national and international studies, like all developing countries, India needs to strengthen the school health services.

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