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ORIGINAL RESEARCH

Prevalence and Pattern of Refractive Errors in School going Children- An Observational Study

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ABSTRACT

Background: One of the leading causes of avoidable visual impairment is refractive error. It impacts individuals across all age categories and social-economic status. The present study was conducted to assess prevalence and pattern of refractive errors in school- aged children. **Materials & Methods:** 150 eyes of 75 children age range 3-17 years of both genders were selected for the study. All were divided into 3 groups as follows group I (3-7 years), group II (8-12 years) and group III (13-17 years). All underwent cycloplegic refraction followed by objective refraction. **Results:** Group I had 10 boys and 15 girls, group II had 13 boys and 12 girls and group III had 14 boys and 11 girls. 21 children in group I, 17 in group II and 19 in group III had refractive errors. The difference was non- significant (P> 0.05). Refractive errors in group I, group II and group III were simple myopia in 13, 11 and 10, simple hypermetropia in 5, 7 and 4, compound myopic astigmatism in 3, 2 and 5, compound hypermetropic astigmatism in 1, 1 and 3, simple myopic astigmatism in 1, 3 and 2 and mixed astigmatism in 2, 1 and 1 patients respectively. The difference was significant (P< 0.05). **Conclusion:** There was high prevalence in refractive errors in all age groups. School children should be regularly screened for refractive errors. In addition, it is important to increase awareness of the use of electronic devices, particularly among children in urban areas.

Keywords: children, refractive errors, vision

INTRODUCTION

One of the leading causes of avoidable visual impairment is refractive error. It impacts individuals across all age categories and social-economic status. Intrinsic optical defects that lead to decreased vision cause light to focus in front of or behind the retina, resulting in refractive errors.[1]Refractive errors are typically identified during early childhood. Furthermore, the count of blind-person-years caused by refractive error in developing nations is almost double that of cataract-related blindness. A significant part of children's daily activities, especially those involving play, writing, and reading, necessitates strong visual abilities.[2]

It is estimated that 19 million children have vision impairment. Out of this group, 12 million children are affected by vision impairment caused by refractive error. For children aged 5 to 15, several factors contribute to the noncorrection of refractive errors, with the lack of screening and the availability and affordability of refractive corrections being the most significant. However, cultural disincentives also contribute to the issue, as indicated by surveys from countries where routine screening and provision of corrections are either free or readily available, yet compliance is still low.[3]

Refractive errors are particularly prevalent in children because they do not voice complaints and adapt to their circumstances. VISION 2020 - The Right to Sight initiative aimed at eradicating avoidable blindness has prioritized the correction of refractive errors, categorizing it as part of "childhood blindness".[4] Myopia usually causes vision defects to manifest during school years. In school-aged children, this is the most prevalent refractive error, and correcting it appropriately and in a timely manner prevents permanent disability.[5]The present study was conducted to assess prevalence and pattern of refractive errors in school- aged children.

MATERIALS & METHODS

The study was carried out on 150 eyes of 75 children age range 3-17 years of both genders. All parents gave their written consent to participate in the study.

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Data such as name, age, gender etc. was recorded. All were divided into 3 groups as follows group I (3-7 years), group II (8-12 years) and group III (13-17 years). All underwent cycloplegic refraction followed by objective refraction.Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Age and gender wise distribution

Age group (years)	Group I	Group II	Group III
Boys	10	13	14
Girls	15	12	11

Table I shows that group I had 10 boys and 15 girls, group II had 13 boys and 12 girls and group III had 14 boys and 11 girls.

Table II Prevalence of refractive errors

Groups	Number	P value
Group I	21	0.73
Group II	17	
Group III	19	

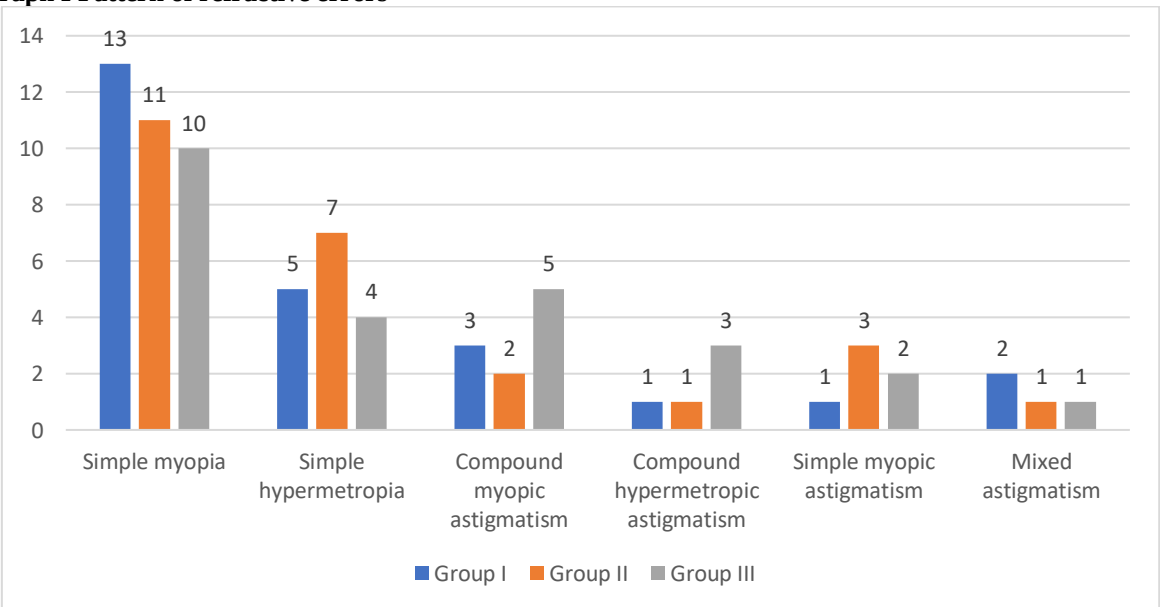
Table II shows that 21 children in group I, 17 in group II and 19 in group III had refractive errors. The difference was non- significant (P> 0.05).

Table III Pattern of Refractive Errors

Refractive Errors	Group I	Group II	Group III	P value
Simple myopia	13	11	10	0.05
Simple hypermetropia	5	7	4	
Compound myopic astigmatism	3	2	5	
Compound hypermetropic astigmatism	1	1	3	
Simple myopic astigmatism	1	3	2	
Mixed astigmatism	2	1	1	

Table III, graph I shows that refractive errors in group I, group II and group III were simple myopia in 13, 11 and 10, simple hypermetropia in 5, 7 and 4, compound myopic astigmatism in 3, 2 and 5, compound hypermetropic astigmatism in 1, 1 and 3, simple myopic astigmatism in 1, 3 and 2 and mixed astigmatism in 2, 1 and 1 patients respectively. The difference was significant (P< 0.05).

Graph I Pattern of refractive errors



DISCUSSION

It is found that uncorrected refractive errors are the primary cause of low vision, which hinders academic performance, decreases productivity, and diminishes quality of life.[6] School children aged 12 to 15 are deemed a high-risk group as hyperopia stabilizes, myopia begins to develop, and the effects of puberty and near work start to impact refractive error pattern

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development during this period.[7,8] School children represent an ideal group for studying refractive errors, as over 80% of them attend school, which is easily accessible and provides an excellent opportunity for health services and education.[9]The present study was conducted to assess prevalence and pattern of refractive errors in school- aged children.

We found that group I had 10 boys and 15 girls, group II had 13 boys and 12 girls and group III had 14 boys and 11 girls. Srivastava T et al[10]assessed the prevalence of refractive errors among school-going children in urban and rural areas.This was a cross-sectional study that included 2024 children going to schools situated in urban and rural areas. All study subjects were tested for visual acuity for distance using Snellen's chart with and without glasses after taking a brief history regarding visual complaints. All children who had visual acuity less than 6/6 on Snellen's chart underwent refraction check-ups. Retinoscopy was performed in all study subjects. The mean age of the children was 10.92 ± 2.73 years, with 10.93 ± 2.73 years in urban and 10.91 ± 2.73 years in rural groups. Females (n=1031; 50.93%) were more in number than males (n=993; 49.06%). The overall prevalence of refractive error was 17.43%. The prevalence was higher in urban areas (22.14%) than in rural areas (12.71%). The age group below 10 years comprised 886 (43.77%) study subjects, and 218 (62.1%) children with refractive error had no ocular complaints. The most common refractive error found in this study was simple myopia in both groups, and the least common was astigmatism. The prevalence of uncorrected refractive error was higher in urban school-going children as compared to rural children.

We found that 21 children in group I, 17 in group II and 19 in group III had refractive errors. Kerkar et al[11]determined the prevalence and pattern of refractive errors as per age, gender and educational standard in school children aged 3- 17 years. Participants were divided into 3 groups as follows 3-8 years, 9-12 years and 13-17 years and evaluation of type of refractive error was done age wise and gender wise. The number of male and female participants was almost similar with a male:female ratio of 1.02:1. Refractive errors were most common in the age group of 9-12 years. The most common refractive error was astigmatism followed by myopia and hypermetropia. It was also found that majority of patients had bilateral refractive errors.

We found that refractive errors in group I, group II and group III were simple myopia in 13, 11 and 10, simple hypermetropia in 5, 7 and 4, compound myopic astigmatism in 3, 2 and 5, compound hypermetropic astigmatismin 1, 1 and 3, simple myopic astigmatism in 1, 3 and 2 and mixed astigmatism in 2, 1 and 1 patients respectively. Hasan et al[12]ascertained the prevalence and pattern of refractive errors among children aged 10 to 16 years among 680 school children during an eye camp under the school health program of the national program for control of blindness. A total of 680 school children from classes sixth to tenth aged 10-16 years participated in the study. Out of 680 students, 545 (80%) had normal vision, 97 (14%) had impaired visual acuity ranging between 6/9 and 6/24, and 38 (6%) had severe VI ranging from 6/36 to 6/60. Among the various types of refractive errors, myopia was the most prevalent affecting 54 children. Age distribution of refractive errors showed myopia to be more prevalent in the age group 13-14 years (16, 14 cases), hypermetropia was more prevalent in the age group 14-15 years (10, 8 cases), and astigmatism 5 cases in the age group 14-15 years.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that there was high prevalence in refractive errors in all age groups. School children should be regularly screened for refractive errors. In addition, it is important to increase awareness of the use of electronic devices, particularly among children in urban areas.

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