A POPULATION BASED STUDY OF REFRACTIVE ERRORS IN CHILDREN AMONG AGE GROUP OF 7-15 YEARS

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ABSTRACT

INTRODUCTION

Refractive error is the most common cause of visual impairment around the world and the second leading cause of treatable blindness. Very early detection and treatment of visual impairment in children results in a reduction in the number of school children with poor sight being uncorrected.

AIM

To study the prevalence of uncorrected refractive errors among children of 7-15 years of age group.

MATERIALS AND METHODS

A total of 958 children of age group 7-15 years were examined during a time period of 1 year from June 2014 to May 2015. The examination included visual acuity, slit lamp examination, auto refractometer, keratometry, A-Scan Biometry and fundoscopic examination. Patients were then taken to assess the refractive error under the cycloplegic effect of 1% homatropine by streak retinoscopy. Hyperopia was defined as spherical power of >+2.00 D, Myopia as <-0.50 D and astigmatism as cylindrical power of >-0.50 D.

RESULTS

Visual impairment (VA of 6/12 or worse in better eye) was present in 8.14% of the children examined. The prevalence of myopia, hypermetropia and astigmatism was 4.70%, 1.24%, 2.2% respectively, Myopia was commonly seen in older age group children.

CONCLUSION

Refractive error was the main cause of visual impairment in children between 7-15 years. Myopia was the most common refractive error particularly in older children. Uncorrected refractive errors among children have a considerable impact on learning and their academic achievement. Diagnosis and correction of refractive error is the most effective form of eye care. As it is an easily treatable cause of visual impairment, effective strategies should be developed to eliminate refractive error in children.

KEYWORDS

Refractive error, Myopia, Hypermetropia, Astigmatism.

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INTRODUCTION: Childhood eye morbidity is defined as "Any eye disease" or condition that requires ophthalmic care and treatment which if untreated can often progress to serious and sight threatening disease.[1] There are 1.4 million blind children in the world and of them it is estimated that 2,70,000 live in India.[2]

Refractive error is the most common cause of visual impairment around the world and the second leading cause of treatable blindnes.[3] Uncorrected refractive error leading to reduced vision is a major problem in school children.[4] About 13% of Indian population is in the age group of 7 -15 years and 20% of children by the age of 16 years develop refractive errors.[5] Very early detection and treatment of visual impairment in children results in a reduction in the number of school children with poor sight being uncorrected.[6] The conditions that are commonly seen in school children are refractive errors like myopia, hypermetropia, astigmatism along with other ocular diseases.[7]

AIM: To study the prevalence of uncorrected refractive errors among children of 7-15 years of age group.

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MATERIALS AND METHODS: The study was conducted during a time period of 1 year from June 2014 to May 2015. The study was carried out in 2 schools among school children of 7 -15 years of age group. Ethical committee clearance was obtained from MVJ medical college and research hospital, Hoskote. Consent of school principal of both schools were obtained. The Examination included are visual acuity measurements, slit lamp examination, retinoscopy, refraction under cycloplegia, examination of anterior segment and fundus. Visual acuity unaided and aided were recorded (If spectacles were used by the subject). Hyperopia was defined as spherical power of >+2.00 D, myopia as <-0.50 D and astigmatism as cylindrical power of >-0.50 D. All the obtained data was used to determine the prevalence of refractive error among school children.

RESULTS: In our study, prevalence of refractive error was 8.14%. Population comprised of 958 children. The prevalence of myopia, hypermetropia, and astigmatism were 4.7%, 1.24%, 2.2% respectively. The prevalence of myopia, hyperopia, and astigmatism were found to be more in girls compared to boys. Myopia was found to be highly significantly associated with girls. Myopia was more commonly seen in older age group children (11-15 years).

DISCUSSION: In the present study prevalence of refractive error was 8.14% and is almost similar to the prevalence obtained by Pavithra et al[8] (7.03%) and Kumar et al[9] (7.4%) in Lucknow.

A study concluded by Dandona et al[4] in Andhra Pradesh found that prevalence of refractive error was 2.7%. The differences in prevalence of refractive error might be due to students belonging to different geographical location, different socio –economic class, different race, gender etc.

The study shows the prevalence of refractive error was more (11.9%) in 11-15 years compared to (4.7%) in 8 -10 years of age group, which is slightly higher to the study by Krishnamurty et al[10] but in accordance to the findings by Pavithra et al,[8] Matta et al[11] and Rathod Hetal K[12] that prevalence of refractive error increases with increasing age. The refractive error was more in girls (18.5%) compared to boys (2.8%), similar findings were reported by Seema et al[13] and Pavithra et al.[8] But studies by Rathod Hetal K et al[12] and Bhattacharya R H et al[14] found that refractive error was more in boys than in girls.

In this study, myopia of <-0.50 D was found in 45 students accounting for about 4.7% of prevalence. A study by Krishnamurty et al[10] showed 5.17% and Batra et al[7] observed 6.97% in school children. Myopia was more prevalent in girls (11.60%) and in higher age group (11 -15 years) that is (8.46%). Murthy et al,[3] Pavithra et al[8]) and Batra et al[7] have reported the increase in incidence of myopia with increase in age.

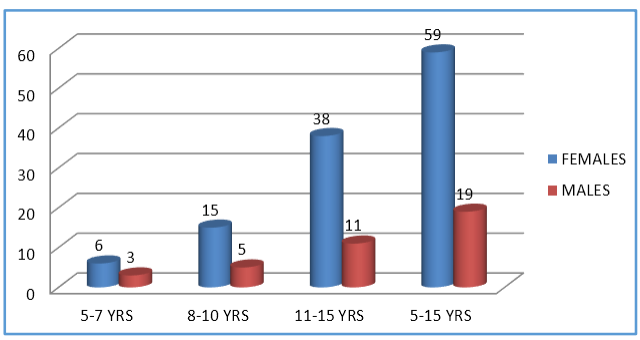
Hypermetropia was found in 12 students (1.24%) and was found more in younger age group (5 -10 years). It was seen in 7 girls and 5 boys. Murthy et al[3] reported decrease in cases of hypermetropia with increase in age and also a significant association of hypermetropia with females.

Prevalence of Astigmatism was 2.2% accounting for about 21 students, 15 were females and 6 were males and about 10 of them were in 11 -15 age group.

Age	Females	Males	Total
5-7 Yrs.	6	3	9
8-10 Yrs.	15	5	20
11-15 Yrs.	38	11	49
5-15 Yrs.	59	19	78

Table 1: Age and sex wise distribution of refractive errors

Refractive errors had higher prevalence in females than males which is statistically significant (P=0.0001) and in 11-15 years' age group.

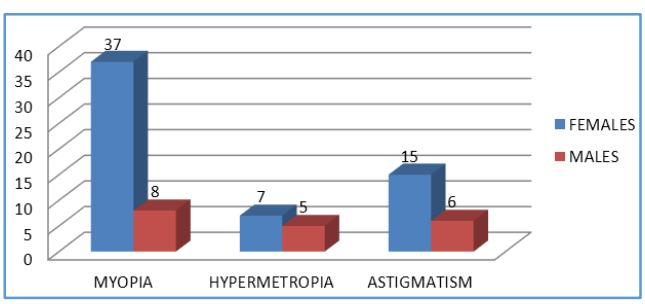


Graph 1: Age and sex wise distribution of refractive errors

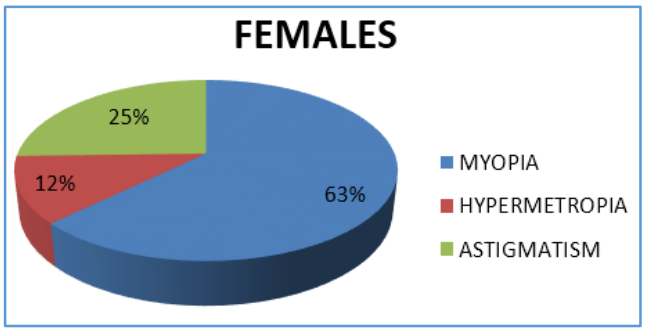
Refractive Erorrs	Females	Males	Total
Myopia	37	8	45
Hypermetropia	7	5	12
Astigmatism	15	6	21
Total	**59**	**19**	**78**

Table 2: Comparison of various types of refractive errors in females and males

In comparison more number of myopia is the most prevalent Refractive error in females than hypermetropia and astigmatic cases reported was statistically significant (P=0.0001).



Graph 2: Comparison of various types of refractive errors in females and males



Comparison of various types of refractive errors in females and males

CONCLUSION: Refractive error is the main cause of visual impairment in children between 7 -15 years. Myopia is the most common refractive error particularly in older children. Girls are more commonly affected than boys. Uncorrected refractive error among children have a considerable impact on learning and their academic achievement. Diagnosis and correction of refractive error is the most effective form of eye care.

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