Refractive error scenario in paediatric age group (7-15 years) in Assam: A hospital based study

Harsh Vardhan Singh[1,*], Dileep Kumar[2]

[1]M.S. Ophthalmology, Dept. of Ophthalmology Regional Institute of Ophthalmology, Guwahati, Assam, [2]Consultant Surgeon, Udayachal Charitable Eye Hospital, Rajnandgaon, Chhattisgarh, India

*Corresponding Author: Harsh Vardhan Singh
Email: hvsc008@gmail.com

Abstract

Aim: To study the prevalence of various types of Uncorrected Refractive errors in a paediatric age group (7-15 years) attending a tertiary care centre.

Materials and Methods: A hospital based cross sectional study was carried out to evaluate proportion of various types of uncorrected refractive errors in age group of 7–15yrs. in a tertiary eye care centre for a period of 3 months.
Total of 4000 children were screened for presence of refractive error after taking informed consent from their parents. Children were then grouped into different types of refractive errors based on the results of cycloplegic refraction.

Results: Out 4000 children, the most common age with refractive error was 10-12 years followed by 13-15 years and the commonest refractive error was astigmatism (55%) followed by myopia (34%). The most common presenting symptom was headache followed by visual disturbance. Significant family history was noted among group with prevalence of positive family history in 17% of study group.

Discussion & amp, Conclusion: Astigmatism & Myopia is the commonest types of refractive error in children that was consistent with other Indian studies. Study suggests the significance of early school based screen to reduce the burden of childhood ocular morbidity because of uncorrected refractive error.

Keywords: Uncorrected refractive error, Childhood blindness, Assam, Scenario.

Introduction

Refractive error is one of the major contributors to preventable cause of blindness & visual impairment.[1] The estimated prevalence of visually impaired population is 3 percent of world's total population, which means that more than 180 million peoples belong to visual impaired group. Out of these, 33% of population is contributed by South East Asian Region.[2] Refractive error is the second most common cause of treatable blindness accounting for about 20% of total visual impaired population after cataract in India.[3]

Out of total 1.5 million blind children in world, 27 lacs reside in India. Since children do not usually complain of visual difficulties, early diagnosis and prompt treatment of eye diseases in these age group is crucial, as lack of self reporting of symptoms & ignorance can lead to progression to irreversible cause such as amblyopia[4]. Poor vision especially in age group of 7-15 yrs. has adverse influence in child's development & may lead to poor performance in school. Visual impairment because of refractive errors has huge economic burden in Indian and the knowledge about prevalence of various types of refractive error in pediatric age group (7-15yrs.) in different regions of India will be helpful in making proper strategy for eliminating this preventable cause of blindness.

The present study aims to estimate the prevalence of refractive error in age group of 7-15yrs. attending the outdoor of RIO, Guwahati and analyzing the causes of uncorrected defective vision prevalent in this region.

Materials and Methods

Present study was hospital based cross-sectional study from July. 2015 to Dec. 2015. Ethical clearance for the study was obtained from ethical committee of GMCH. During this study period, 4000 children with refractive errors presenting in RIO, OPD were screened. Consent for the study was obtained from their parents. Proper history & thorough ocular examination, including slit lamp examination, fundus evaluation & cycloplegic refraction were carried out by trained ophthalmologist & optometrist.

Exclusion Criteria: Children with coexisting organic eye diseases were excluded.

Observation and Results

Present study showed most common age group of refractive error to be 10-12yrs. (48% of total) followed by 13-15yrs. (40% of total) and the age group with least prevalence was among 7-9yrs. age group (12% of total study population) [Table 1].

The commonest type of refractive error in the present study was Astigmatism (55% of total) followed by Myopia (34% of total) & least being hypermetropia (11% of total) [Table 2]. In our study refractive error was more common among female child with overall prevalence of 55% of total study group [Table 3]. Based on clinical types, myopic astigmatism (41% of total refractive error cases) followed by simple myopia (34% of the total) was commonest in the study. While the maximum prevalence was among age group of 13-15yrs. & 10-12yrs. [Table 4,5]. Among Myopic males the most common age group was 10-12yrs. (280 of 440; 66.6% of total Myopic male) followed by 13-15yrs. group (160 of 440; 33.3% of total) while in females, most

prevalent age group of myopia was 10-12yr group (480 of 960; 50% of total Myopic female) followed by 13-15yr of age (360 of 960; 37.50% of total). Hypermetropia was more common in males with maximum prevalence in 13-15yrs (120 0f 320; 37.50% of total Hypermetropic males). Astigmatism was maximum in 12-14yrs. age (1400 of 2640; 53% of total Astigmatism) followed by 10-12yrs age (600 of 2640; 22.72% of total).

The common presenting symptoms of uncorrected refractive error in present study were headache (55%) followed by blurring of vision (39%). Other symptoms like near vision defect, watering, redness, recurrent infection contributes only 6%.

Associations of family history with uncorrected refractive error were noted in 17% in the present study with maximum association seen in male child. (24 out of 90 vs 10 out of 100).

Table 1: Age wise distribution of study population

Age in years	No of patients	Percentage
7	160	4%
8	160	4%
9	160	4%
10	680	17%
11	240	6%
12	1000	25%
13	640	16%
14	520	13%
15	440	11%

Table 2: Clinical types of refractive errors

Clinical Type	No. of patients	Percentage
Myopia	1360	34
Hypermetropia	440	11
Astigmatism	2200	55

Table 3: Sex distribution of study population

Sex	No. of children
Female	2200
Male	1800

Table 4: Percentage of refractive errors

Types of refractive errors	No. of males	Percentage	No. of females	Percentage
Myopia	560	14%	800	20%
Hyperopia	120	3%	320	8%
Astigmatism	1120	28%	1080	27%
Total	1800		2200	

Table 5: Demographic profile

Sex	7	8	9	10	11	12	13	14	15	Total
Male	-	40	-	80	80	160	40	80	80	560
Female	-	40	40	120	120	200	80	200	0	800
Total	0	80	40	200	200	360	120	280	80	1360

Table 6: Sex distribution of refractive errors

Types of refractive errors	No. of males	(%)	No. of females	(%)
Myopia	560	14%	800	20%
Hyperopia	120	3%	320	8%
Astigmatism	1120	28%	1080	27%
Total	1800		2200	

Table 7: Comparison of age and sex with myopia

Sex	7	8	9	10	11	12	13	14	15	Total
male	-	40	-	80	80	160	40	80	80	560
Female	-	40	40	120	120	200	80	200	0	800
Total	0	80	40	200	200	360	120	280	80	1360

Table 8: Comparison of age and sex with hyperopia

Sex	7	8	9	10	11	12	13	14	15	Total
male	40	-	-	40	-	120	40	-	80	320
female	-	-	-	40	-	40	-	-	40	120
total	40	-	-	80	-	160	40	-	120	440

Table 9: Breakup of astigmatism into different groups

Types	No of children with error	Percentage
Simple hypermetropic astigmatism	280	7%
Compound hypermetropic astigmatism	200	5%
Simple myopic astigmatism	840	21%
Compound myopic astigmatism	800	20%
Mixed astigmatism	80	2%
Total	2200	55%

Table 10: Clinical symptoms with respect to sex

Symptoms	Male	Female	Total
Diminution of vision	800	760	1560
Headache	880	1320	2200
Others	120	120	240

Table 11: Family history present in the total study group

Family History	Percentage
Yes	17%
No	83%

Discussion

In present study, 55% of refractive error were either simple myopic (34%) or simple myopic astigmatism (21%) followed by compound astigmatism (25%) & hypermetropia (16%), similar results were noted in GP Kantha et al.[8] Padhye et al reported similar results in their study. They have also reported the prevalence of myopia, hypermetropia and astigmatism was 1.45%, 0.39% and 0.21%, respectively in the child rural population. In their study simple myopia was more prevalent.[5]

In the study refractive error among girls were more as compared to prevalence among boys & which was consistent with other Indian studies.[6,7] In present study, most common age group presenting with refractive error was 10-12yrs. followed by 13-15yrs, which was consistent with other Indian studies.[8-10] Present study demonstrated presence of family history of refractive error in 17% of study population; similar association was noted in Prema et al study.[11]

Conclusion

Refractive error is quiet common among school going children especially in developing countries like India & large fractions of cases remain undiagnosed & never report to the hospitals. Early diagnosis & simple interventions like glass correction can reduce the burden of preventable cause of blindness in these age group.

Conflict of Interest: None

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