Refractive Errors in School going Children in Kashmir

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ABSTRACT

Introduction: Large number of studies on the prevalence of refractive errors in various population groups have been done. Refractive errors, are by far the commonest cause of defective vision in school children around the world. Undetected and uncorrected refractive errors are particularly a significant problem in school children. With these rationales this study was undertaken in schools of Kashmir with the objective to assess the magnitude of refractive errors.

Material and Methods: This cross-sectional study was conducted in schools of Kashmir valley from june 2016 to may 2017. Sample size was calculated to be 1110. The 6 to16 years children of selected schools of Kashmir valley who were present on the day of the interview were interviewed and examined. Snellen chart, pinhole, a trial box, a trial frame, self-illuminated vision box and streak Retinoscope were used to detect refractive error. MS excel package and SPSS11.5 software was use for analysis.

Results: Out of 1110 cases (2220 eyes),856(77.12%) cases were emmetropic, 56 (5.04%) cases had hyperopia of 0.25D to 1.75D whereas only 4(0.36%) cases had a hyperopia of equal to or greater than 2.0D. Myopia was the most common observed refractive error. 188(16.94%) cases had a myopia of 0.25D to 1.75D and 6 (0.54%) cases had a myopia of 2.0D to 3.75D.No case had myopia of equal to or greater than 4.0D(Table-V) Myopic astigmatism was seen in 22 (1.98%) cases and hyperopic Astigmatismin 10(0.9%)cases.

Conclusion: Refractive error was a significant cause of visual impairment among school children and screening of school children plays a major role in detecting refractive errors.

Keywords: Refractive Errors, School going Children

INTRODUCTION

Refractive error is one of the most common causes of visual impairment around the world and the second leading cause of treatable blindness.[1] Reliable data on prevalence and distribution of refractive error from population-based surveys are needed to plan cost-effective programs for reduction of visual impairment and blindness. Few population-based data on refractive error are available from India,[2] but some are available for children attending school.[3] Data obtained only from children going to school cannot be reliably used to plan eye-care services, however, because they are not representative of the population at large, particularly in India, where a significant proportion of school-aged children do not attend school.[4] To address a widespread need for population-based data on childhood refractive error, a Refractive Error Study in Children (RESC) protocol was prepared to assess the prevalence of refractive error and related visual impairment in children of different ethnic origins and cultural settings, by using consistent definitions and methods.[5] RESC surveys were recently conducted in China, Nepal, and Chile, and results have been published.[6,7,8]

With these rationales this study was undertaken in schools of Kashmir with the objective to assess the magnitude of refractive errors.

MATERIAL AND METHODS

The present study was conducted in the department of Ophthalmology, Government district hospital Pulwama Kashmir. The sample of school children (Age 6 - 16yrs) was selected from the local areas. To assess the prevalence of refractive errors in school children stratified random sampling was adopted. A 10% institution of the total was drawn at random with the help of 2 digit random sample table. The questionnaire comprised of 2 blocks where in Block 1 refers to identification, that is name of institution, class, section, roll number, name, age and sex of the child. Block 2 comprised of relevant history and examination. History included any history of diminution of vision, headache, eye strain, redness, watering, itching, deviation of eyes or use of spectacles. It also included amount of near work (reading and writing) in hours per day. Every child was systemic examined and examination of Snellen s test type was adopted (6 Meter). Retinoscopy at 1 meter distance by cycloplegia using 1% cyclopentolate. Detailed fundus examination was done in every case using direct ophthalmoscope.

RESULTS

In the group, out of 404 (808 eyes) male children, 334(82.27%) eyes had a vision of 6/6 on right side whereas 83.08% recorded a vision of 6/6 on left side. 50 (12.32%) eyes had a vision of 6/9 on right side and 52 (12.94) on left side. 22 eyes (5.42%)on right side and 16 eyes (3.98%) on left side had a vision ranging from 6/12 to less than 6/60. Out of 706 (1412 eyes) females, 574 (81.30%) eyes on right side and 586 (83.60%) eyes on left side recorded a vision of 6/6 whereas 108 (15.21%) eyes had a vision of 6/9 on right and 100 eyes (14.16%) on left side. 20 eyes (2.82%) recorded a vision of 6/12 to 6/60 and 4 eyes (0.56%) recorded a vision

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Distribution of ocular refraction in spherical equivalents in rural school children in relation to age and sex

Age (years)	Sex	Hyperopia		Emmetropia	Myopia			Total
		>2.0D	<0.25-1.75D		0.25D-1.75D	2.0D-3.75D	>=4.0D	
6 – 7	M	X	3	17	6	X	X	26
	%	0.00	11.54	65.38	23.08	0.00	0.00	
	F	x	3	33	3	x	x	39
	%	0.00	7.69	84.62	7.69	0.00	0.00	
8 – 9	M	1	1	11	1	1	X	15
	%	6.67	6.67	73.33	6.67	6.67	0.00	
	F	1	3	33	7	x	x	44
	%	2.27	6.82	75.00	15.91	0.00	0.00	
10 – 11	M	X	4	28	7	1	X	40
	%	0.00	10.00	70.00	17.50	2.50	0.00	
	F	x	3	21	9	x	x	33
	%	0.00	9.09	63.64	27.27	0.00	0.00	
12 – 13	M	X	3	46	2	X	X	51
	%	0.00	5.88	90.20	3.92	0.00	0.00	
	F	x	3	94	23	x	x	120
	%	0.00	2.50	78.33	19.17	0.00	0.00	
14 – 15	M	X	1	31	9	X	X	41
	%	0.00	2.44	75.61	21.95	0.00	0.00	
	F	x	1	67	14	x	x	83
	%	0.00	2.41	80.72	16.87	0.00	0.00	
16	M	X	1	20	7	1	X	29
	%	0.00	3.45	68.96	24.14	3.45	0.00	
	F	x	1	27	6	x	x	34
	%	0.00	2.94	79.41	17.65	0.00	0.00	
Total	N0.	2	28	428	94	3	X	555
	%age	0.36	5.04	77.12	16.94	0.54	0.00	

of less than 6/60 on right side .20 eyes (2.82%) recorded a vision of 6/12 to 6/24 and no case had a vision of 6/36 or less in the left eye. Table.

Out of 1110 cases (2220 eyes), 856 (77.12%) cases were emmetropic. 56 (5.04%) cases had hyperopia of 0.25D to 1.75D whereas only 4 (0.36%) cases had a hyperopia of equal to or greater than 2.0D. Myopia was the most common observed refractive error. 188 (16.94) cases had a myopia of 0.25D to 1.75D and 6 (0.54%) cases had a myopia of 2.0D to 3.75D. No case had amblyopia of equal to or greater than 4.0D (Table-5) Myopic astigmatism was seen in 22 (1.98%) cases and hyperopic Astigmatism in 10 (0.9%) cases. Refractive error significantly varies in rural and urban population (P<0.01). There is no significant difference in refractive error as per sex distribution in rural as well as urban population. It was also observed that urban school children spent four hours in reading and writing at school and an average of four hours at home, whereas rural school children spent about 4 hours in reading and writing at school and an average of one to two hours at home.

DISCUSSION

Myopia was the most common refractive error in both groups, 23.08% in urban group and 17.48% in rural group. Lower degrees of myopia 0.25D to 1.75D comprised almost 95% of total myopics in both groups. A higher prevalence has been reported in Taipei, Taiwan by Luke Long – Kuang Lin[9] whereas, lower prevalence has been reported in Malanesian school children by Garner LF et al[10] and Kalikivayi V.[11] Such differences in prevalence could be due to difference in population. In the present study prevalence of myopia was found to be significantly higher among children less than 13 years. This suggests indirectly that myopia is progressive and/or that the onset of myopia may be delayed in some children. Myopia was more prevalent in urban group (p<0.05). This observation is consistent with the observations of Chandra et al.[12] Increased prevalence of myopia in urban population is attributed to increased literacy rate and educational demands. The duration of study hours was found to have a positive correlation with the myopia. Economic development and myopia has also been correlated and found that higher the per capita income, higher the incidence of myopia. Myopia is known in all races and variation is also found within and between population subgroups. So far, it cannot be stated whether myopia is environmental or hereditary. In low myopia there is little doubt of the importance of genetic factors but this does not exclude environmental factors like poor lighting, poor ventilation and overcrowding.[13] Garner LF et al[14] reported that there was no difference in the prevalence of Myopia between girls and boys which is similar to our results.

The prevalence of hyperopia was found to be 5.4% in rural group and 8.09% in urban group. There was no significant difference between male and female children.

Astigmatic refractive errors are less common in both groups, but were seen in higher percentage in urban group. The present study supports the assumption that vision screening of school children could be useful in detecting correctable causes of decreased vision, especially refractive errors, and in minimizing long term permanent visual disability. All the children with refractive error in both groups improved to normal or near normal visual acuity with appropriate correction.

CONCLUSION

The young children with substandard vision rarely show obvious symptoms unless the defect is gross. This problem could be resolved by a reliable visual test of every child very early in the school carrier. The large scale use of illiterate E should enable reliable vision tests to be done at 6JD year. More so vision screening of school children should be included in the state school health programmes so that defective children are detected early and long term visual disability minimize.

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