



REFRACTIVE ERROR SCREENING AMONG SCHOOL GOING CHILDREN OF AGE GROUP 5-11 YEARS IN DISTRICT KANGRA, HIMACHAL PRADESH.

Ophthalmology

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ABSTRACT

BACKGROUND/AIMS- Uncorrected refractive errors are the main cause of visual impairment in school-going children. So, to assess the magnitude of the problem the present study was conducted among the school going children aged 5-11 years in Kangra district.

METHODS- A cross sectional study was conducted in 14 primary coeducational government schools, randomly selected and about 506 school children were examined from May 2015 to May 2016. Preliminary examination was carried out at their respective schools and detailed ophthalmic examination was done in ophthalmology department of tertiary centre.

RESULTS- Refractive errors (32%) constituted the major cause of ocular morbidity in government school. The overall prevalence of refractive errors was 12%, amblyopia and squint 2.8% each. Low vision (visual acuity < 6/18) in the better eye was observed in 505 (99.9%) children and blindness (visual acuity < 6/60) in 1 (0.1%) children. Results suggested that 92% of children were with uncorrected refractive error.

CONCLUSIONS- Refractive error is an important cause of avoidable blindness among government school children. A school eye screening cum intervention programme with periodic evaluation seems to be appropriate in this region of North India.

KEYWORDS

Refractive Errors, Visual Impairment, Prevalence, Government School, Primary School Children

INTRODUCTION

Refractive error is one of the most common causes of visual impairment around the world and second leading cause of avoidable blindness². Vision impairment during childhood can affect communication, employment, quality of life and the effects are lifelong³. The visual impairment due to refractive error is potentially curable if early attention is given². The overall incidence of refractive errors was found to vary from 21% to 25% of patients attending eye outpatient departments in India⁴. Children do not complain of defective vision, and they adjust to their poor vision by holding books close to the face, and frequent rubbing of eyes. So this affects learning ability, performance and adjustment in school, and overall development of a child. Later on, it may have a negative impact on social health and employment opportunities. So the effective methods of vision screening in school children are useful in detecting correctable uncorrected refractive errors and in minimizing long-term visual disability⁵. Moreover, schools provides best platform for effectively implementing the comprehensive eye healthcare programme⁶. There is a lesser data available regarding prevalence of refractive error in government school children in Himachal Pradesh. This study is of great importance as it will provide this valuable data which will lead to early diagnosis and initiation of treatment and also enable those with low vision and color vision defects to choose appropriate vocation and training.

MATERIALS AND METHODS

The study was conducted in Kangra block, Himachal Pradesh, North India among school-going children of age 5-11 years from selected government schools from May 2015 to May 2016. Kangra is a most populous district, situated in eastern part of Himachal Pradesh. According to 2011 census, it has a total population of 1,510,075 with 94.29% in the rural area and 5.71% urban area⁷. Majority of children screened were from age group 8-9 years. The principals of the selected schools were informed about the study and permission for the visit to the selected schools was sought personally. The data collection instrument was a pretested semi structured interview cum examination proforma was used. All study subjects were interviewed as per attached proforma after getting written informed consent from the teacher/parent/guardian. Visual acuity was assessed using Snellen's vision chart with optotypes on each line at 6-meter fixation distance.. The cut off of uncorrected visual acuity for defining ocular morbidity due to refractive error in this study was taken as a visual acuity of $\leq 6/9$ in the worst eye. Ocular motility was evaluated in all six cardinal positions of gaze and in nine diagnostic positions. All the study subjects were clinically examined with torch-light. Those who required special examination process were advised to come to department of ophthalmology, Medical College, Kangra where further evaluation and appropriate treatment was given. Data thus collected was entered into Epiinfo 3.2 version software. Descriptive analysis was done; quantitative variables were tested with Chi-square t test for

assessing the level of significance.

RESULTS

A total of 506 school children of age group 5-11 years were screened for ocular morbidity which included 43% males and 57% females from 14 government schools.

Table 1- Gender breakdown of students in selected schools

GOVERNMENT SCHOOLS (NO. OF CHILDREN)	
MALE	217 (44.3%)
FEMALE	289 (55.9%)
TOTAL	506 (50.2%)

Refractive error was major cause of visual impairment accounting 32%, amblyopia (7%), squint (7%), followed by other causes like infective eye diseases (18%), conjunctivitis (17%), vitamin A deficiency (13%), and miscellaneous eye disorders (6%).

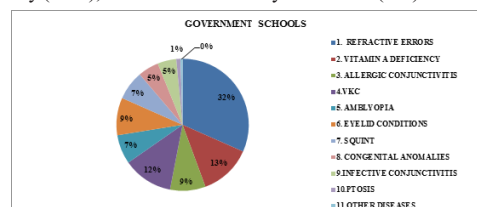


Figure 1- Prevalence of refractive errors and other ocular diseases in government school going children in age group 5-11 yrs in dist. Kangra.

The overall prevalence of refractive errors 12%, amblyopia and squint 2.8% each. Myopia was found in 3.3% and hypermetropia in 9.5%. Higher prevalence of refractive errors in younger age group (5-9 years) was seen because there was high prevalence of age-related hypermetropia (8.5%) in young children. This relation was found to be statistically significant.

Table 2- Relation between age and spectrum of refractive errors.

AGE	MYOPIA	HYPERMETROPIA	TOTAL
5-6yrs	4	8	12
6-7yrs	3	19	22
7-8yrs	2	22	24
8-9yrs	10	18	28
9-10yrs	6	19	25
10-11yrs	1	6	7
11-12yrs	7	3	10
TOTAL	33	95	128

Majority of primary school children had visual acuity in normal range 6/6-6/18 in either eye. Whereas, one child (0.1%) had moderate visual

impairment with visual acuity in range <6/18-6/60 and none had severe visual impairment with vision <6/60-3/60.

There was no gender difference for prevalence of refractive errors. There was significant relation between age and refractive error.

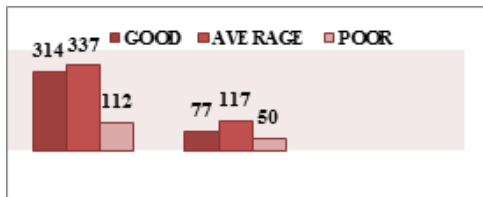
Results suggested that 5 (8%) children had already corrected refractive error with glasses as compared to 57 (92%) children with uncorrected refractive error.

	CORRECTED RE	UNCORRECTED RE
GOVERNMENT SCHOOLS NO. OF CHILDREN	5	57
GOVERNMENT SCHOOLS PERCENTAGE	8%	92%

2- Children with corrected and uncorrected refractive error (R.E.) in government schools.

In this study, school performance was significantly affected by uncorrected Refractive errors. Majority of children (45.1%) had average school performance and 16.1 % had poor school performance.

Figure 3- School performance of children with out and with refractive error



DISCUSSION

Eyes are the most treasured organs of a human being. Although vision is very important for all ages but it is more so in case of children as it plays a key role in their mental, physical and psychological development⁸. Screening school children is arguably the second largest national programme for control of blindness in India after cataract surgery⁹. Various studies done in India and other developing countries quoted the spectrum of various types of refractive disorders as leading cause of visual impairment in school-going children⁹. Similarly in this study, prevalence of refractive error was most common cause of ocular morbidity, seen in 12 % children, which is higher than the study conducted by Gupta et al. in U.P.¹⁰, and Kumar et al. in Delhi¹¹, who reported prevalence 6.8% and 5.4% respectively. In contrast, the study done by Biswas et al.¹² in West Bengal found higher prevalence of refractive errors (23%). Similarly, higher prevalence of refractive errors has been observed among school going children in Shimla⁵ and Ahmedabad¹³. In comparison to this study lower prevalence of squint was reported by Gupta et al⁵, who observed the prevalence 2.5%. Whereas, lower prevalence was found by Desai et al⁶ in Rajasthan (0.2%) in 4-18 years age group. In the present study prevalence of amblyopia was found to be 2.8% which is much higher than reported from other studies¹³. The most common cause for amblyopia noted by these studies was refractive error which was similar to this study. As per result of current study, majority of primary school going children had visual acuity in normal range 6/6 -6/18. Only one child (0.1%) had moderate visual impairment with visual acuity in range <6/18-6/60 in better eye, which was much lower than observed in the study conducted by Rustagi et al.¹ in rural Delhi, reported vision < 6/60 in 0.93% children. The current study also included school performance of every child and its relation with refractive error was also determined. Results suggested that school performance was significantly affected by uncorrected refractive error. Majority of children (45.1%) had average school performance (figure 3).The current work, conducted in Kangra, confirms the high prevalence of uncorrected refractive errors 92% among government school students in North Indian area and highlights the urgent need to implement at school level health facility-based, cost-effective strategies, and appropriate eye care programs targeting school children. Thus, it will reduce the burden of visual impairment in the younger population in this region of North India.

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