



## PREVALENCE AND PATTERN OF REFRACTIVE ERRORS IN CHILDREN STUDYING IN MUNICIPAL PRIMARY SCHOOLS OF WEST DELHI

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### ABSTRACT

**Objective:-** To assess the prevalence and pattern of refractive errors in children studying in municipal primary schools of west Delhi.

**Material and Methods:-** Children of both genders studying in class 1st to 5th under school screening programme underwent visual acuity assessment. Children with defective vision were further examined employing objective refraction using autorefractometer followed by streak retinoscopy after instilling cycloplegic eye drops. Children with any kind of refractive errors were evaluated and categorized according to refractive error.

**Results:-** The prevalence of refractive error in primary school children in west Delhi was... No significant difference in prevalence of refractive error between males and females was seen. Most common refractive error was myopia followed by astigmatism and hypermetropia.

**Conclusion :-** Refractive error is one of the leading cause of treatable blindness in school age children. There is a need to have regular vision testing in schools for children and emphasis should be made on educating children and parents for using spectacles to easily eliminate this treatable cause of blindness.

### KEYWORDS :

#### Introduction

Childhood visual impairment due to uncorrected refractive errors is one of the most common problems in school-age children and is the second leading cause of treatable blindness<sup>1</sup>. Uncorrected refractive errors are responsible for upto 42% of the cases of visual impairment worldwide<sup>2</sup>, and remain prevalent even in high income countries.<sup>3,6</sup> Uncorrected refractive error in both low and high income countries they have significant economic implications in terms of potential lost productivity<sup>7</sup>. Approximately 12.8 million children in the age group 5-15 years are visually impaired from uncorrected or inadequately corrected refractive errors, estimating a global prevalence of 0.96%<sup>8</sup>. Because of the increasing realization of the enormous need for correction of refractive errors worldwide, this condition has been considered one of the priorities of Vision 20-20 - The right to sight, a global initiative launched by a coalition of non government organizations and the World Health Organization<sup>9</sup>.<sup>10</sup> Vision is essential for successful learning in school. Child's routine schoolwork and day to day activities also get affected with defective vision. Refractive errors prevail in common among school-age children. The students are not mature enough to realise the deficiency at the early stage or the parents have no idea on the gradually developing vision problem. This results in tiredness, distraction, headache and other asthenopic symptoms. Children who have been affected could not concentrate on studies or on any other curricular or extra curricular activities.

#### Objective:-

Our study aims at evaluating prevalence and pattern of refractive errors in children studying in municipal primary schools of west Delhi. The purpose of this study was to gather information on the refractive status of students so that an effective approach can be planned to tackle the burden of readily correctable refraction problems in school children.

#### Material and Methods

A total of 3240 children studying in classes 3<sup>rd</sup> to 5<sup>th</sup> in MCD primary schools of west Delhi were included in the study. Out of these, 1767 (55%) were males and 1473 (45.0%) were females, giving a male female ratio of 1.21, they were taken as samples for this study by convenient random sampling method to measure the prevalence of Refractive Error. Screening was done at the respective class rooms by the doctor with the help of a nurse in the presence of class teachers. Students present in the class on the day of examination were screened. The number of students who were found to be having vision problems was carefully noted by the investigator. Referral slips were provided to the needful for further examination and treatment.

In hospital ocular examination including VA both for distance and

near, objective refraction with autorefractometer followed by streak retinoscopy under cyclopentolate 1% eye drops, stereopsis, anterior segment, and fundus examination was done. The parents of all children were informed about the nature of the study and a written consent was obtained. The patients with history of prior ocular surgery or any ocular disease contributing to the diminished VA, manifest strabismus and pathological myopia were excluded from the study

#### Results and discussions

After the analysis, observations were noted in the following Tables 1-4. Unaided VA was normal (6/6) in 2769 (85%) children. 223 students (6.84%) had presenting VA 6/9-6/12 and 123 students (3.8%) had VA 6/18-6/60 (Table-1). 104 (3.2%) students were wearing glasses out of which 38 (1.16%) students had presenting VA 6/6. Unaided VA worse than 6/60 was present in 125 (4.36%) students. After refractive correction, visual acuity was improved to 6/6 in 3214 students (99.1%). 26 (0.9%) students were amblyopic with VA < 6/12 after refractive correction.

A total of 471 children (14.53%) had refractive error. Refractive error was prevalent in 261 males (14.77%) and 210 females (14.25%) (Table- 2) There was no significant difference between the prevalence of refractive error between males and females ( $p > 0.05$ ). Of the total 471 children with refractive error, astigmatism was present in 162 (34.59%) cases, hypermetropia in 70 (14.90%) and myopia in 239 (50.5%) cases. (Table-3)

The prevalence of myopia was 56% in males and 44% in females. The prevalence of hypermetropia was 57% in males and 43% in females. The prevalence of astigmatism was 48.7% in males and 51.3% in females (Table-4)

The presenting VA was 6/6 in 85% students, while after refractive correction 99.07% students could attain a VA of 6/6.

**Table 1: Distribution of unaided visual acuity (VA)**

VA	Unaided Number	Unaided %Age
6/6	2769	85%
6/9-6/12	223	6.84%
6/18-6/60	123	3.8%
<6/60	125	4.36%

**Table 2: Sex Distribution of students**

Sex	No.	%Age
Males	1767	55.0
Females	1473	45.0

**Table 3: Distribution of type of refractive errors among cases and the study group**

Type of refractive error	No. Of students	% among the students
Myopia	239	50.5%
Hypermetropia	70	14.90%
Astigmatism	162	34.59%
Total	471	100%

**Table 4: Association of sex with type of refractive error**

Sex	Type of Refractive error		
	Myopia	Hypermetropia	Astigmatism
Male	56%	57%	48.7%
Female	44%	43%	51.3%

**Conclusion**

The present study shows that most of the children or the parents are unaware of the refractive error or they feel shy to wear eye glasses, especially girls. Our results raise the need for school-based program that provides prescription of glasses when needed to students at no cost, through government and non-governmental collaborative fund, along with educating them about the treatment of refractive errors and proper use of glasses.

Therefore, screening in school and pre-school should be carried out periodically. In addition, school going children and their parents should be educated about signs and symptoms of refractive errors, ocular hygiene and the risk factors involved in the development of these errors and other ocular pathological problems. During screening for refractive errors, adequate arrangements, illumination and clarity of the chart must be considered and ocular fatigue should be avoided. The data support the assumption that vision screening of school children in developing countries could be useful in detecting curable causes of vision problems provided detected at the early stage especially refractive errors by which long term visual disability could be avoided.

The presenting VA was 6/6 in 85% students, while after refractive correction 99.1% students could attain a VA of 6/6. Our results raise the need for school-based program that provides prescription of glasses when needed to students at no cost, through government and non-governmental collaborative fund.

26 (0.9%) students in our study suffered from amblyopia. Amblyopia treatment is most effective when done early in the child's life, usually before the age of seven.<sup>34</sup> School screening is the best way to detect amblyopia in school children.

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