



A STUDY ON REFRACTIVE ERRORS AMONG THE SCHOOL GOING CHILDREN IN TERTIARY CARE CENTRE OF ASSAM

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ABSTRACT **Purpose:** To determine prevalence and pattern of refractive errors in school going children in the age group of 5 to 16 years, at tertiary care hospital, in Assam. **Design of study:** Prospective study Design **Materials And Methods:** This series was conducted in Regional Institute of Ophthalmology, Gauhati Medical College from November 2021 to April 2022. A total 1050 children were found with refractive error. All patients aged 5-16 years were examined thoroughly. Cycloplegic refraction was done and type of refractive error was evaluated along with Retinoscopy. **Results:** Refractive error was more prevalent in females (55.61%) in comparison to males (44.38%). and most of children (71.90%) are in of 11-16 years age group. Myopic astigmatism was the most common (37.42%) type of refractive errors, and it was more common (40.79%) in 11-16 years age group. The prevalence of Amblyopia was 1.80%. Amblyopia was more common among the males (57.89%) as compared to females(42.10%). **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 : Myopia, hypermetropia, astigmatism, refraction, 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 Studies around the world indicate that refractive errors are common in all ages^{2,3,4} The worldwide study of distribution of refractive errors showed that 800 millions to 2.3 billions people have suffered from refractive errors⁵

Refractive errors are the most common cause of defective vision in school children. In India, children younger than 15 years constitute about 42% of the population. As well, the fact is that 30% of children lose their eyesight before the age of 20 years.⁶ The refractive errors have been associated with certain other factors as well e.g. a positive history of wearing glasses in the family,⁷⁻⁹ close work or near activity such as prolonged study hours, watching computers / television etc.^{10,11} Some studies also indicate genetic causes.^{12,13,14}

Blindness due to refractive errors in any population, suggests that eye care services in that population are inadequate. Since the treatment of refractive errors is perhaps the simplest and effective forms of eye care, it can easily be prevented. Investigation of the prevalence and causes of visual impairment allows the planning of preventive ophthalmologic programs that can provide more precise interventions directed to the preservation of ocular health.¹⁵

In 1960, the Government of India constituted a school health committee which recommended medical examination of the children at the time of entry into school but this has hardly been in practice in India.¹⁶

MATERIALS AND METHODS

This series is a prospective design which included all patients coming to Out Patient Department of Regional Institute of Ophthalmology, Guwahati from November 2021 to April 2022. All children of age group 5 to 16 years are included who visited OPD in that particular duration.

In this study, a total of 1845 children were examined for refractive error and 1050 children were diagnosed to have refractive error. Patients were divided in two age groups 5 -10 years and 11-16 years. All variables were calculated in both the groups and compared.

The parameters studied were:

Visual acuity measurement with Snellen's chart.

Gross examination of the anterior segment with a torch light.

Streak retinoscopy and refraction.

Examination of media and fundus by direct ophthalmoscope and Indirect ophthalmoscope

Inclusion Criterion

- All School going children in the age group of 5-16 years irrespective of gender coming to OPD of RIO, Guwahati.
- Unilateral or binocular visual acuity less than or equal to 6/9 in either or both eyes.
- Patient with a history of previous treatment/currently taking amblyopia treatment.

Exclusion Criteria

- Students having corneal injuries or corneal opacity and cataract corneal injuries were excluded.
- Patients having other associated disease or infection like conjunctivitis, vernal kerato conjunctivitis trachoma, ulcers, retinal diseases and diseases of optic nerve have been excluded from study.
- As most of the patients in age group of 0- 5 years remain unaware of symptoms of refractive errors, they don't consult due refractive problems, so this group was excluded
- Patient with prior intraocular or refractive surgery.

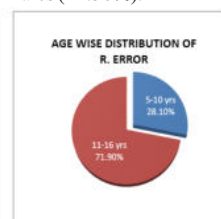
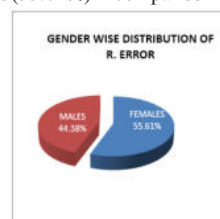
RESULTS AND OBSERVATION

In this study, a total of 1845 children were examined. Out of these, 1150 were females and 695 were males. 1050 children were diagnosed to have refractive error. Among this 584 were females and 466 were males.

Table 1: Distribution of refractive error according to age and sex

	5-10 YEARS	11 TO 16 YEARS	TOTAL
FEMALE	155 (52.54%)	429 (56.82%)	584 (55.61%)
MALE	140 (47.45%)	326 (43.17%)	466 (44.38%)
TOTAL	295 (100%)	755 (100%)	1050 (100%)

Refractive error was found in 56.91% children attending OPD. Gender wise distribution showed that refractive error was more prevalent in females (55.61%) in comparison to males (44.38%).

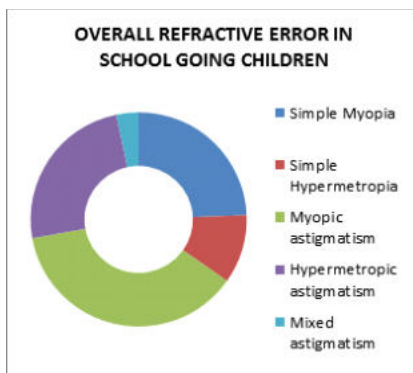
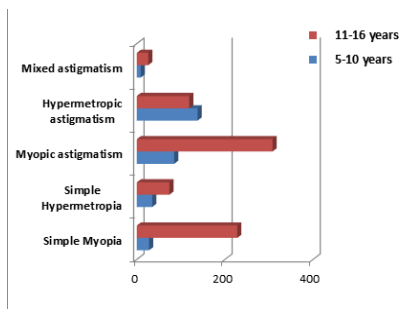


Age wise distribution showed that 28.10% of patients were in 5-10 year group and 71.90% of children in of 11-16 year age group have refractive error.

Table 2: Distribution of different refractive errors according to age group

TYPES OF R. ERROR	5-10 YEARS	11-16 YEARS	TOTAL
Simple Myopia	28 (9.50%)	228 (30.19%)	256 (24.38%)
Simple Hypermetropia	35 (11.86%)	74 (9.80%)	109 (10.38%)
Myopic astigmatism	85 (28.81%)	308 (40.79%)	393 (37.42%)
Hypermetropic astigmatism	138 (46.77%)	119 (15.76%)	257 (24.47%)
Mixed astigmatism	09 (03.05%)	26 (03.44%)	35 (03.33%)
Total	295 (100%)	755 (100%)	1050 (100%)

In 5-10 years of age group, hypermetropia is more prevalent refractive error (58.63%), whereas myopia is more prevalent (70.98%) in 11-16 years of age.

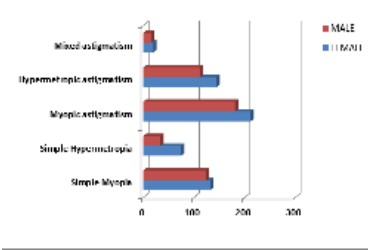


Simple myopia was 24.38% of total refractive error diagnosed Age wise distribution showed that it is more prevalent in 11-16 year age group (30.19%) In 5 -10 year age group, it is less common (9.50%) type of refractive error. Overall data shows that simple hypermetropia is present in 10.38 % all cases of refractive error. However it was more common in 5-10 years age group (11.86%). Myopic astigmatism was the most common (37.42%) type of refractive errors, and it was more common (40.79%) in 11-16 years age group. Hypermetropic astigmatism (24.47%) was second most prevalent refractive error in 5-16 year age group. It is more common (46.77%) among 5-10 years age group, when compared with 11-16 years age group (15.76%).

Mixed astigmatism was least common error. It was noted in only 3.33% of cases.

Table 3: Distribution of refractive errors according to sex

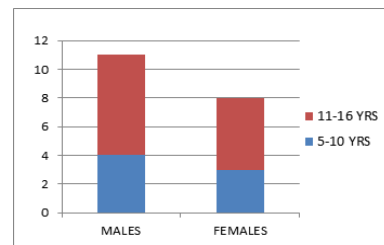
	FEMALE	MALE
SIMPLE MYOPIA	132 (22.60%)	124 (26.60%)
SIMPLE HYPERMETROPIA	75 (12.84%)	34 (07.29%)
MYOPIC ASTIGMATISM	212 (36.30%)	181 (38.84%)
HYPERMETROPIC ASTIGMATISM	145 (24.82%)	112 (24.03%)
MIXED ASTIGMATISM	20 (03.42%)	15 (03.21%)
TOTAL	584 (100%)	466 (100%)



Among females Myopic astigmatism was most common (36.30%) followed by hypermetropic astigmatism (24.82%). Among males also myopic astigmatism was most common (38.84%) followed by simple myopia (26.60%)

Table 4: Age and Gender distribution of Amblyopia

	MALES		FEMALES		TOTAL
AGE GROUP	5-10 YRS	11-16 YRS	5-10 YRS	11-16 YRS	
CHILDREN	4	7	3	5	19

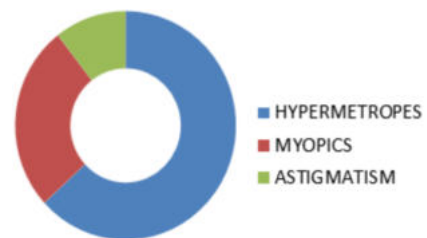


Of the total 1050 children screened, 19 were diagnosed to have amblyopia. The prevalence of amblyopia was 1.80%. Amblyopia was more common among the males (57.89%) as compared to females (42.10%). Maximum number of patients were found in the age group of 11-16 (63.15%).

Table 5: Refractive Errors and Amblyopia

TOTAL AMBLYOPIC CHILDREN	HYPERMETROPES	MYOPICS	ASTIGMATISM
19	12 (63.15%)	5 (26.31%)	2 (10.52%)

Refractive Errors and Amblyopia



Hypermetropia was found to be the most common refractive error in amblyopic eye (63.15%) as 12 out of 19 amblyopic children were hypermetropes, followed by myopia in 5 children out of 19 amblyopics (26.31%) and astigmatism in 2 children (10.5%).

DISCUSSION

In present series, refractive error was more prevalent in females (55.61%) in comparison to males (44.38%). In a study conducted by Tanie Natung et. Al.17 59.5% patients were females, and 40.5% were males which is similar with our series. Niroula DR18 found that prevalence of all the varieties of refractive errors was found more in male than female.

In our series Myopic astigmatism was the most common (37.42%) type of refractive errors among school going children and Hypermetropic astigmatism (24.47%) was second most prevalent refractive error in 5-16 year age group. Simple myopia was 24.38% of total refractive error diagnosed. Simple hypermetropia is present in 10.38 % and Mixed astigmatism was least common error. However, Tanie Natung et. Al.17 observed 59.30% astigmatism, 27.4% myopia and 16.9 % hyperopia. AYUB ALI et al. 19 found proportion of

Amblyopia as 11.2% which was on quite higher side compared to our study.

the prevalence of refractive errors and eye diseases in urban and rural school children. Canadian Journal of Ophthalmology. 2009 Jun 1;44(3):328-33.

Bhutia KL20 published that in different schools of East Sikkim, the prevalence of myopia was the most common with 31.1%, followed by 29.4% of astigmatism and the remaining 2.6% (n = 29) with hyperopia. However Uzma N et al.²¹ stated that Myopia increased consistently with age from 7–15 year in both groups, ranging from 11%–35.5% in the urban group and 15.5%–45.9% in the rural group.

Present series showed in gender wise distribution that refractive error was more prevalent in females (55.61%) in comparison to males (44.38%) which is in contrast to the result published by Niroula DR et al.¹⁸. However, Bhutia KL20 and Uzma N et al.²¹ found similar results regarding sex wise prevalence of all the varieties of refractive errors.

CONCLUSION

In the age groups that we have studied, the prevalence of refractive errors also varies with age. Significant differences in the prevalence between age groups and classes have been demonstrated in our study. With increasing age, children are subjects to cope with school and academic activities. The increase in prevalence of myopia found in our study is probably related to the increased demands for academic schedules. This could represent a risk factor for developing refractive errors in this age group. Our data support the assumption that vision screening of school children in developing countries could be useful in detecting correctable causes of decreased vision especially refractive errors and in minimizing long term visual disability. Most of the children are unaware of their refractive errors. Therefore, screening in school and pre-school ages should be carried out periodically. In addition, children in these ages and their parents should be educated about signs and symptoms of refractive errors, ocular hygiene and for the risk factors involved in the development of these errors and other ocular pathological problems. As this study is a hospital based study, some population based studies are needed to accurately decide the prevalence of refractive errors and its types.

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