

Incidence of Refractive Error in Children Attending Ophthalmology

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Abstract: ***Purpose:** To determine the refractive errors among children within the age 5-12 attending Ophthalmology OPD in Saveetha Medical College. **Method:** A retrospective observational study of patients within the age of 5-12 whose unaided vision were poorer than 20/20 which improved with pinhole, was done. Overall refractive examination was with appropriate cycloplegia for age was done on 164 patients. **Results:** Out of 164 eligible patients, the proportion of Myopia, Hypermetropia, Simple myopic astigmatism, simple hypermetropic astigmatism, Compound myopic astigmatism, Compound hypermetropic astigmatism and mixed astigmatism were 50.60%, 7.92%, 15.85%, 1.82%, 19.51%, 3.65% and 0.60% respectively. It was found that Males are affected more than females. Myopia is found to be the most common refractive error among the age group 5-12 years, followed by Compound myopic astigmatism and Simple myopic astigmatism. The least commonly occurring refractive error is found to be Mixed astigmatism with the least proportion of 0.60%. **Conclusion:** This study has given data on the Incidence of refractive error in children attending ophthalmology department in Saveetha Medical College. It has been found that Myopia is the most commonly occurring refractive error in children followed by compound myopic astigmatism. This study will help the physicians to have an outline on the incidence of patients with refractive error attending Health-care centers. This will also lie as a basement of other community based studies.*

Keywords: Myopia, hypermetropia, Astigmatism, Refractive errors

1. Introduction

Visual defects due to refractive errors are one of the importantly common childhood problems and the second largest cause for treatable blindness [1]. It is calculated that internationally 153 million people over 5 years of age are visually impaired as a outcome of uncorrected refractive errors, of which 8 million are blind [2].

Visual defects from uncorrected refractive errors can have acute and chronic consequences in children and adults, such as difficulty in schooling and acquiring employment, lost income for individuals, families and societies, and diminished quality of life [3]. In the ages between 5–15 years, non-correction of refractive errors is due to many reasons: the absence of screening, accessibility, availability and disability to afford refractive corrections are the very important [4].

Refractive error has been addressed as a major public health problem in even in India by the universal initiative by the WHO as VISION 2020-the right to sight. The loss of vision causes huge human hurt to the affected person and their families as well as economic losses globally. Therefore, this study was conducted to assess the prevalence and pattern of refractive errors among children in the age of 5-12 years attending Saveetha Medical College Ophthalmology department.

2. Objective

- To calculate the percentage of refractive error in children attending
- Ophthalmology department in Saveetha Medical College.
- To analyze the different types of refractive error that occurs in children.

3. Method

A hospital based, retrospective observational study was conducted in the department of ophthalmology in Saveetha Medical College.

Patients who were examined between the periods of 1st of March 2019 to 31st of July 2019 were included in the study. Patients within the age of 5-12 years who were phakic with visual acuity less than 20/20 with improvement on pinhole were selected.

Initially the patients were analysed using Snellen's Illiterate chart 'E' chart to confirm the presence of refractory visual defect, furthermore the patients were tested with cycloplegic 1% cyclopentolate and were subjected to retinoscopy to observe the type and extend of refractive error.

Patients with pseudophakia, aphakia, and organic lesions in the cornea, lens and posterior segment impairing the vision, and one eye were excluded from the study.

The following definitions were used in the study:

- **Myopia** is defined as a spherical equivalent refractive error of at least -0.75 D in one or both eyes. [5]
- **Hypermetropia** is defined as a spherical equivalent refractive error of at least +2.00 D or more in one or both eyes. [5]
- **Astigmatism** is defined (as cylinder powers ≥ 0.50 DC or ≥ 1.00 DC) if one or both eyes were astigmatic. [5]
- **Simple astigmatism** is wherein the rays of light are focused on the retina in one meridian and either in front (simple myopic astigmatism) or behind (simple hypermetropic astigmatism) the retina in other median. [6]
- **Compound astigmatism** is when the ray of light is focused either in front (compound myopic astigmatism) or

behind (compound hypermetropic astigmatism) the retina.

[6]

- **Mixed astigmatism** refers to a condition wherein the light rays in one meridian are focused in front and in other meridian behind the retina. [6]

4. Result

Out of 200 patients attending the ophthalmology out patients department, 185 were eligible for the study and 21 we not willing to participate in the study so, a total of 164 patients

were studied. The age of patients ranged from 5 years to 12 years. Both males and females were included in this study.

Gender distribution of patients is given in Table 1 and the distribution of different refractive errors are given in Table 2.

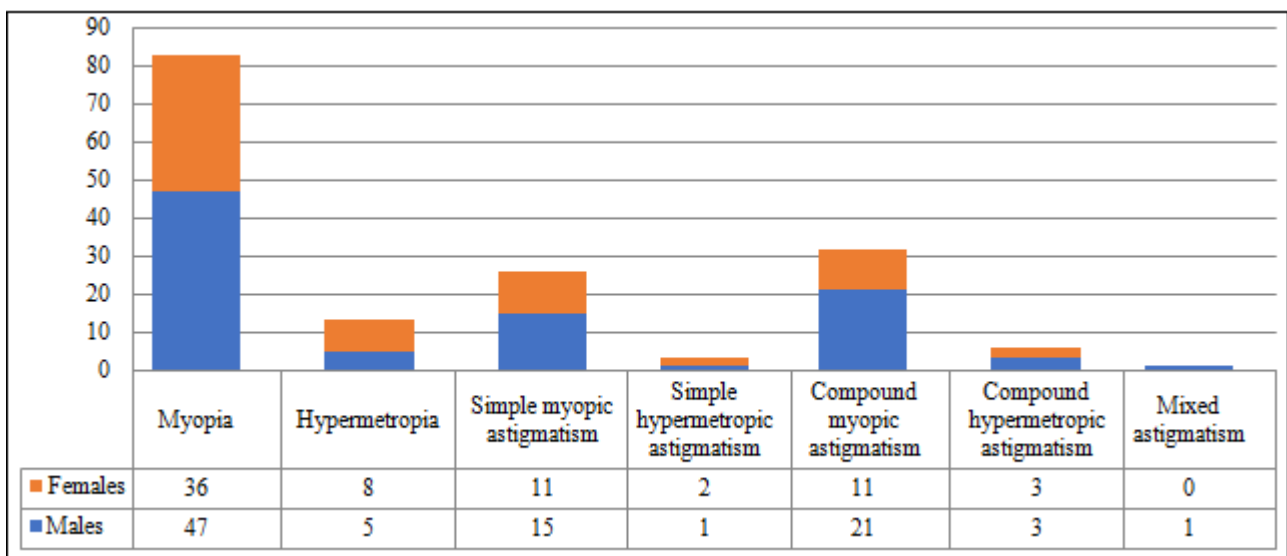
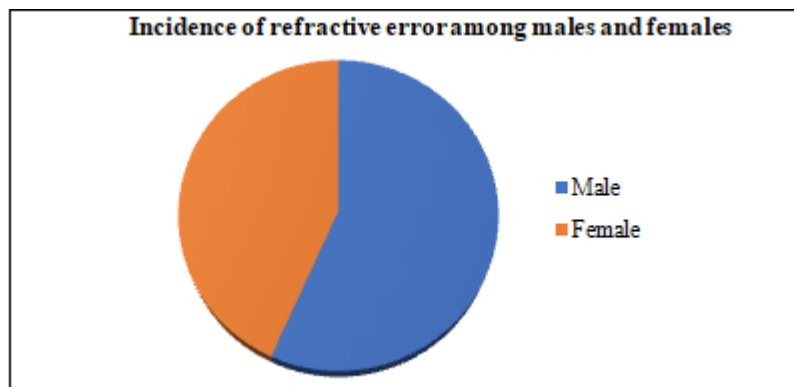
Table 1: Demographics

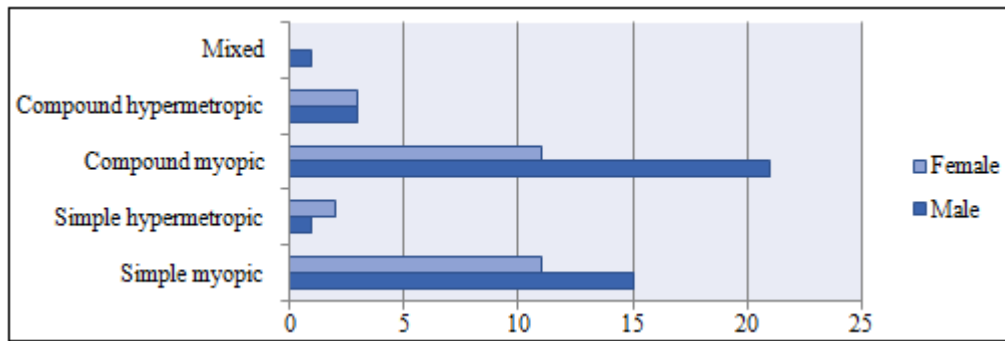
Gender	Number/Percentage
Male	93 (56.7%)
Female	71 (43.3%)
TOTAL	164

Table 2: Distribution of Refractive error

Gender/Refractive error	Myopia	Hypermetropia	Simple myopic astigmatism	Simple hypermetropic astigmatism	Compound myopic astigmatism	Compound hypermetropic astigmatism	Mixed astigmatism
male	47 (21.95%)	5 (3.04%)	15 (8.53%)	1 (0.60%)	21 (6.70%)	3 (1.82%)	1 (0.60%)
female	36 (28.65%)	8 (4.87%)	11 (7.31%)	2 (1.21%)	11 (12.80%)	3 (1.82%)	0 (0.00%)
Total	83 (50.60%)	13 (7.92%)	26 (15.85%)	3 (1.82%)	32 (19.51%)	6 (3.65%)	1 (0.60%)

In males the Incidence percentage is at 56.7% Whereas in females it is 43.3%





Incidence of Astigmatism:

It is found that out of the total 164 patients studied 68 (41%) were found to be astigmatic.

Representation of Incidences of types of astigmatism is given in the below mentioned chart

According to the study it was found that out of 164 patients studied 93 (56.7%) were males and 71 (43.3%) were females who suffered from refractive error.

It was also found that a total of 83 (50.60%) patients were Myopic out of which 47 (21.95%) were males and 36 (28.65%) were females, 13(7.92%) were hypermetropic out of which 5 (3.04%) were males and 8 (4.87%) were females, 26 (15.85%) were Simple myopic astigmatic out of which 15 (8.53%) were males and 11 (7.31%) were females, 3 (1.82%) were Simple hypermetropic astigmatic out of which 1 (0.60%) were males and 2 (1.21%) were females, 32 (19.51%) were Compound myopic astigmatic out of which 21 (6.70%) were males and 11 (12.80%) were females, 6 (3.65%) were Compound hypermetropic astigmatic out of which 3 (1.82%) were males and 3 (1.82%) were females and 1 (0.60%) male was Mixed astigmatic.

5. Discussion

Uncorrected visual impairment can lead to a long term disagreeable consequences such a reading difficulties, employment, family and social disabilities. Uncorrected refractive errors can lead to other complications such as amblyopia (lazy-eye) which is very complex to treat and recover from.

A careful history taking along with picking up symptoms such as headaches as the day progress, straining of eyes, is required in order to early diagnose refractive error in young children. If left uncorrected it may lead to the disinterest in studies for the student. In severe cases physical injuries may occur due poor vision acuity. It is the job of the Health care workers to spread awareness about dangers of refractive error in young age, need for eye screening. Screening in school has found to be a very useful way to screen students for any refractive error.

In this study it is found that myopia is the most common refractive error, measure can be taken in order to screen, diagnose and treat myopia at an early age so as to prevent any other mental, physical or social stress mainly in school going children, as it interferes with their day to day interaction and studies.

6. Conclusion

To conclude, the incidence of refractive error among patients attending ophthalmology department in Saveetha Medical College have been found and myopia is found to be the most commonly occurring refractive error in 5-12 years of age. It is also found that astigmatism also plays an important role as a refractive error in this age group. As there are not many published studies on refractive errors in and around Saveetha medical college, this study will serve as a first step in conducting other related studies, community based studies on the incidence of refractive error in various parts. This study will provide physicians an overview on the incidences of refractive error presenting to any medical centers. As refractive error is a very common cause of vision defect it is important for health care officials to know about the ongoing prevalence and incidence of refractive error in health care centers.

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