



Retrospective Analysis And Prevalence Of Trend In Refractive Errors In General Eye OPD

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Abstract

Aim- Aim of the study was to analyse the pattern in refractive error among the patients attending a general ophthalmology OPD of Kalyanam Karoti Eye Institute over a defined retrospective period.

Methodology- A Retrospective cross-sectional observational study was done and the data for the same was taken from the OPD and Opticals of Kalyanam Karoti Eye Institute Mathura. This data was taken in the time period of July to September 2025. All data were collected electronically and analysed manually.

Result- It was found that out of 237 subjects, Female-46.41% and Male – 53.58%. Out of 237 subjects 228 took spectacles with required lenses Out of 228 subjects 128 patients took bifocal lenses, 2 patients took progressive lenses, 93 patients took single vision lenses, 5 patients took single vision lenses with higher powers. The mentioned lenses were prescribed for the different type of refractive error. The most frequent refractive error was simple hyperopia with presbyopia.

Conclusion- This Retrospective analysis shows that most common refractive error is simple myopic astigmatism and simple hyperopia with presbyopia. For different refractive error, different lenses were prescribed to the patients. Most of the patients preferred bifocal lenses and only few patients preferred progressive lenses.

Keywords: Refractive error, Bifocal Lens, Progressive lens, Presbyopia Myopia, Hypermetropia, Astigmatism, emetropia

Introduction

Refractive errors are the most common cause of visual impairment globally, affecting a significant portion of the population across various age groups and regions. These errors occur due to issues in focusing light precisely onto the retina, usually because of the shape of the eye, which results in decreased visual acuity and a range of symptoms such as blurry vision, headaches, and eye strain. The primary types of refractive errors include myopia (near-sightedness), hyperopia (far-sightedness), astigmatism, and presbyopia, with

myopia being increasingly prevalent, especially in certain populations and younger age groups.(1)

Globally, it is estimated that one to two billion people are affected by refractive errors, and a substantial proportion of these cases remain uncorrected, making refractive errors a leading cause of visual impairment and preventable blindness. The distribution and prevalence of these errors vary by age, gender, and regional factors, with children and the elderly being particularly affected by hyperopia and presbyopia,

respectively. Uncorrected refractive errors not only impair vision but also negatively impact quality of life, educational achievement in children, and economic productivity, highlighting the importance of early detection, diagnosis, and intervention.(2)(3)

In India refractive errors are reported to be the second leading cause of avoidable blindness and the most common cause of moderate visual impairment, affecting both children and adults across rural and urban population.(4)(5)

Recent decades have shown a sharp increase in the prevalence of myopia, particularly among school-aged children and young adults, attributed to lifestyle changes such as increased screen time, reduced outdoor activity, and excessive near work (6) This has led to growing concern over the projected "myopia epidemic," especially in urbanizing regions (7) Hospital-based retrospective studies, especially from general ophthalmology outpatient departments (OPDs), can provide crucial insight into the real-world burden and trends of refractive errors. Unlike community-based surveys, OPD data reflect actual patient demand and can help in understanding the pattern of refractive disorders in those actively seeking care (8) However, there is limited literature from India focusing specifically on the trend analysis of refractive errors in general OPD settings, where data from diverse age groups and socio-economic backgrounds can highlight critical public health gaps. Understanding these trends can aid in developing targeted screening programs and refractive services, especially in the context of India's National Programme for Control of Blindness (NPCB) and the World Health Organization's Vision 2020 goals (9)(10)

Therefore, this study aims to assess the prevalence and pattern of refractive errors and to analyze their trends over time among patients attending a general ophthalmology OPD at a tertiary care center. The findings are expected to inform clinical strategies and health policy planning aimed at reducing the burden of uncorrected refractive errors.

Methodology

This Hospital-based retrospective cross-sectional observational study was conducted at Kalyanam

Karoti Eye Institute Mathura. The data for the same was taken from the OPD and Opticals of Kalyanam Karoti Eye Institute Mathura.

Study Design:

- 1. Retrospective cross - sectional Observational study
- 2. Setting: OPD of Kalyanam Karoti Eye Institute Mathura
- 3. Time period: July to September 2025
- 4. Data Sources: OPD and Optical records
- 5. Inclusion Criteria: All Patients diagnosed with refractive error during the study period from July 2025 to September 2025
- 6. Exclusion Criteria: Those with previous history of ocular Surgery Or trauma, children who were not cooperative for refraction and cycloplegics, patients with incomplete records, patients who diagnosed with ocular media optically cataract, congenital abnormalities anterior segment disorders.

Every patients undergone a standard refraction routine. History taking followed by visual acuity measurement by snellen’s chart then refraction done for every patients. For Children Cycloplegics refraction was done and then we give number on next visit by doing PMT (Post mydriatic test). For adults and aged people refraction done by using A.R. (auto refractometer) and subjective refraction. Then the number for the lens is prescribed followed by Fundus evaluation by the slit lamp and then the patient visit Optical to buy the Spectacles.

Result and Discussion

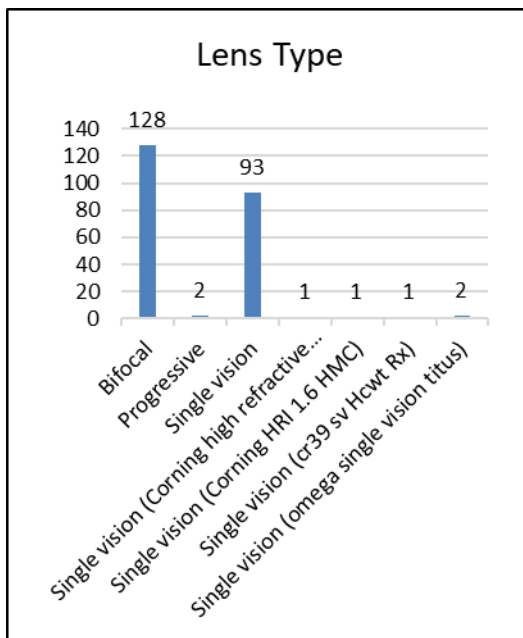
It was found that out of 237 subjects, Female-46.41% and Male – 53.58%. Table 1 show that Out of 237 subjects 228 took spectacles with required lenses 9 patient (subjects) deny for spectacle currently as they have same spectacle power previously Out of 228 subjects 128 patients took bifocal lenses, 2 patients took progressive lenses, 93 patients took single vision lenses, 5 patients took single vision lenses with higher powers. The mentioned lenses were prescribed for the different type of refractive error. The most frequent refractive error was simple hyperopia with presbyopia.

Table 1

LENS TYPE

Row Labels	Count of Lens Type
Bifocal	128
Progressive	2
Single vision	93
Single vision (Corning high refractive index)	1
Single vision (Corning HRI 1.6 HMC)	1
Single vision (cr39 sv Hcwt Rx)	1
Single vision (omega single vision titus)	2
Grand Total	228

Graph A1



Graph A2

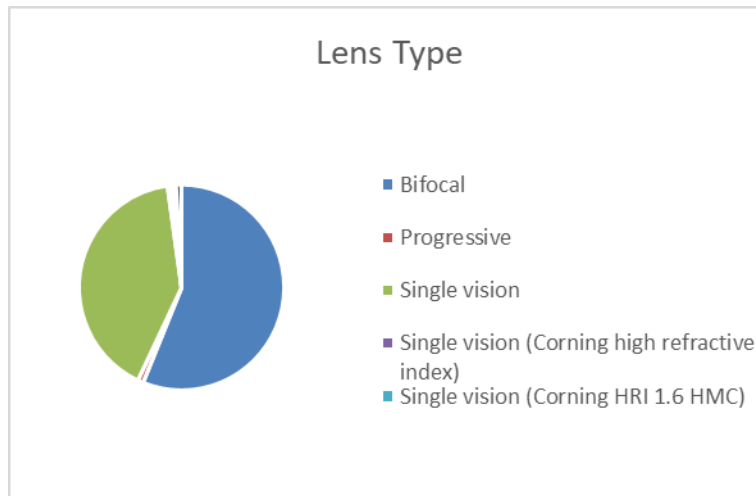


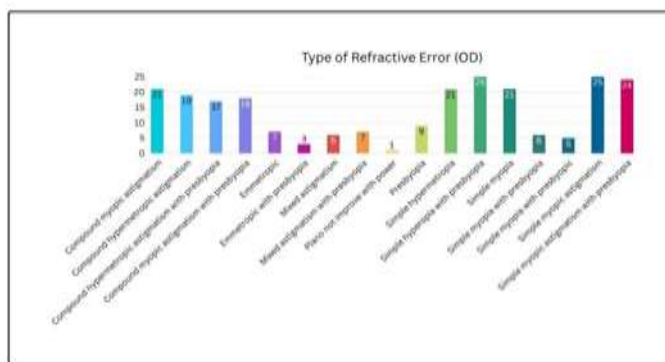
Table 2

**COUNT OF TYPE OF
REFRACTIVE ERROR**

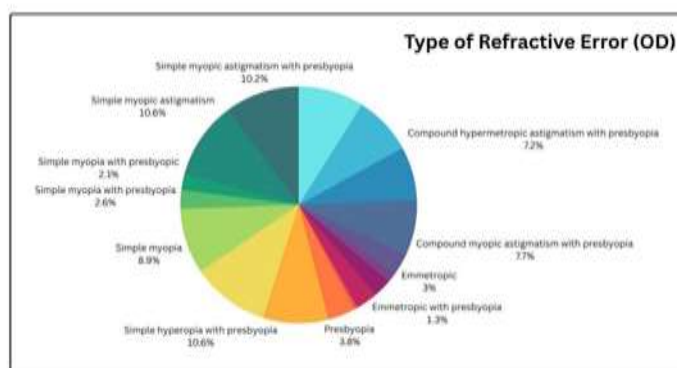
Row Labels	(OD)
Compound myopic astigmatism	21
Compound hypermetropic astigmatism	19
Compound hypermetropic astigmatism with presbyopia	17
Compound myopic astigmatism with presbyopia	18
Emmetropic	7
Emmetropic with presbyopia	3
Mixed astigmatism	6
Mixed astigmatism with presbyopia	7
Plano not improve with power	1
Presbyopia	9
Simple hypermetropia	21
Simple hyperopia with presbyopia	25
Simple myopia	21
Simple myopia with presbyopia	6
Simple myopia with presbyopic	5
Simple myopic astigmatism	25
Simple myopic astigmatism with presbyopia	24
Grand Total	235

As we go for the type of refractive error, we differentiate it into two columns OD and OS (Right and Left Eye) now table 2 shows that type of refractive error in OD and table 3 shows that type of refractive error in OS. Figure B1 and B2 shows that Out of 235 Subjects 21 Subjects were found with Compound myopic astigmatism, 19 subjects with Compound hypermetropic astigmatism, 17 with compound hypermetropic astigmatism with presbyopia, 18 subjects were found to suffering from compound myopic astigmatism with presbyopia, 7 with Emmetropic, 3 with Emmetropic with presbyopia, 6 with Mixed Astigmatism, 7 with Mixed Astigmatism with presbyopia, 1 with plano not improve with water, 9 with presbyopia, 21 with simple hypermetropia, 25 simple hyperopia with presbyopia, 21 with simple Myopia, 6 with simple myopia with presbyopia, 5 with simple myopia with presbyopia, 25 with simple myopic astigmatism, 24 with simple myopic astigmatism with presbyopia .

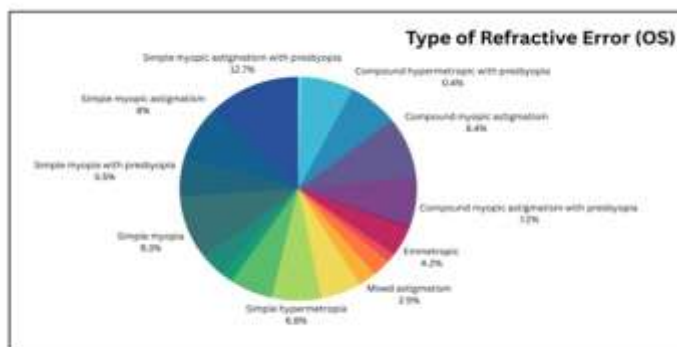
Graph B1



Graph B2



Graph C1



Graph C2

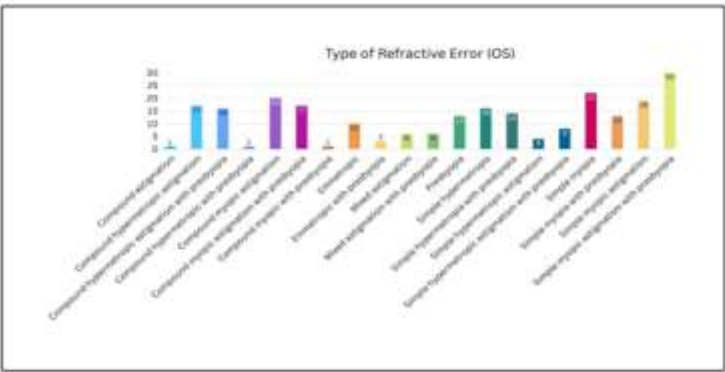


Table 3

COUNT OF TYPE OF REFRACTIVE ERROR

Row Labels	(OS)
Compound astigmatism	1
Compound hypermetropic astigmatism	17
Compound hypermetropic astigmatism with presbyopia	16
Compound hypermetropic with presbyopia	1
Compound myopic astigmatism	20
Compound myopic astigmatism with presbyopia	17
Compound myopic with presbyopia	1
Emmetropic	10
Emmetropic with presbyopia	3
Mixed astigmatism	6
Mixed astigmatism with presbyopia	6
Presbyopia	13
Simple hypermetropia	16
Simple hypermetropia with presbyopia	14
Simple hypermetropic astigmatism	4
Simple hypermetropic astigmatism with presbyopia	8
Simple myopia	22
Simple myopia with presbyopia	13
Simple myopic astigmatism	19
Simple myopic astigmatism with presbyopia	30
Grand Total	237

Conclusion

This study shows that clinically significant astigmatism is more prevalent than any of the refractive errors. If we subdivide this the most common refractive error is simple Hypermetropia with presbyopia and simple myopic astigmatism. Refractive errors contribute significant proportion of ocular morbidity in the general population attending the OPD. The findings highlight the need for regular vision screening and increased awareness, specially among younger individuals. Understanding these trends can help optimize resource allocation and preventive strategies in eye care services.

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