Original Article

A Study of the Pattern of Ocular Morbidity Among the Elderly Residing in Old Age Homes in Sub-urban Areas of Ramanagara

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Abstract

Background: Ocular morbidity is a significant health issue affecting the elderly, impacting their quality of life, independence, and overall well-being. This study aims to assess the prevalence of ocular morbidity among 122 elderly living in four old age homes in suburban areas around Ramanagara, Karnataka, India.

Methods: A cross-sectional study design was employed, and detailed ophthalmic examinations were conducted using standard diagnostic tools. The results reveal a high prevalence of ocular diseases, with cataracts (52.5%) being the most common, followed by uncorrected refractive errors and presbyopia (35.2%), age-related macular degeneration (ARMD-12.3%), and glaucoma (9%).

Conclusion: The findings highlight the need for regular eye care services and comprehensive health programs to address the ocular health needs of the elderly in these communities.

Keywords: old-age, ageing, ocular diseases, morbidity, old age homes.

Introduction

The global population of elderly individuals is rapidly increasing, and with it, the prevalence of age-related ocular morbidities. According to the World Health Organization (WHO) the global population includes slightly over one billion older persons, making up approximately 13.5%, as of 2021. By 2030, it is projected that one in six individuals will be 60 years old or more.[1] In India, this demographic shift is especially notable, with the proportion of people aged 60 and above expected to double from 10.5% in 2022 to 20.8% by 2050.[2] Ocular morbidity in the elderly encompasses a range of conditions, including cataract, refractive errors, age-related macular degeneration (ARMD), glaucoma, and diabetic retinopathy. These

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conditions not only affect vision but also contribute to falls, fractures, decreased mobility, social isolation and cognitive decline in mental health and frailty (vision-cognitive impairment).[3,4]

In the past, elderly care facilities were primarily managed by nonprofit organizations and were intended for the impoverished and underprivileged. The middle- and upper-middle-class elderly who can afford to pay for care in old age have also been served by paid institutions in recent years.[5] In India, as the elderly population is growing, the sub-urban areas, particularly those around major cities, are witnessing a significant influx of older adults. Sub-urban areas often have limited access to healthcare services, including ophthalmic care, which can exacerbate ocular morbidity. Old age homes are increasingly becoming a common living arrangement for the elderly, especially those economically disadvantaged or lacking family support.[6] These institutions provide a unique setting to study the ocular health status and patterns of morbidity among the elderly.

Ramanagara, a district in Karnataka, India, has a few old age homes that cater to the elderly population. The present study aims to assess the pattern of ocular morbidity among elderly residents in four old age homes located in sub-urban areas of Ramanagara. The findings of this study can contribute to the development of targeted interventions and health policies to improve the ocular health of the elderly in these settings.

Materials and methods

A cross-sectional study was conducted to assess the pattern of ocular morbidity among 122 elderly residents of four old age homes in sub-urban areas around Ramanagara. The study was approved by the Institutional Ethical Committee (IEC) and informed consent was obtained from all participants.

Study population:

The study population consisted of 122 elderly residents (aged 60 years and older) from all four old age homes in sub-urban areas of Ramanagara.

Sample size:

There are four old age homes in the district. The elderly residing in all old age homes formed the sample size which is 122. Purposive sampling technique was employed.

Data Collection

Data collection was carried out over a period of six months from January 2024 to June 2024. Detailed ophthalmic examinations were conducted by a team of ophthalmologists. The examination included visual acuity testing, torch light examination of the anterior segment, intraocular pressure (IOP) measurement by digital tonometry, and dilated fundus examination. A semi-structured questionnaire was administered to gather demographic information, medical history, and lifestyle factors.

Statistical Analysis

Data were analysed using SPSS software version 20. Descriptive statistics were used to summarize the demographic and ocular morbidity data. Chi-square tests were employed to identify significant associations between demographic factors and ocular morbidities. A p-value of less than 0.05 was considered statistically significant.

Results:

Demographic Characteristics:

The study included 122 elderly residents from all the four old age homes with a mean age of 72.5 years (range: 60-91 years). The majority of the participants (76.2%) were female, and 65.6% were aged 70 years and older. The educational level of the participants was good, with 68.7% having attended school. Most of the residents (83.6%) had a sedentary lifestyle, and 52.5% had a history of chronic diseases, including hypertension and diabetes mellitus.

Ocular Morbidity

The most common ocular morbidity identified in the study was cataract, affecting 52.5% of the participants. Uncorrected Refractive errors and presbyopia were the second most prevalent condition, affecting 35.2% of the residents. Other common ocular morbidities included Age-related macular degeneration (ARMD) (12.3%), glaucoma (9.0%), and diabetic retinopathy (5.7%).

The visual acuity of the participants was categorized as follows: 45.9% had normal visual acuity

(6/9 or better), 11.5% had mild visual impairment (6/9 to 6/18), 38.5% had moderate visual impairment (6/18 to 6/60), and 4.1% were legally blind (worse than 6/60).

Association Between Demographic Factors and Ocular Morbidity:

The study found significant associations between certain demographic factors and specific ocular morbidities. Age was significantly associated with the prevalence of cataract (p = 0.029), uncorrected refractive errors and presbyopia (p = 0.0011), ARMD (p= 0.0003) and Glaucoma (p= 0.0004). Gender was not significantly associated with any ocular morbidity. However, educational level was significantly associated with uncorrected refractive errors (p = 0.0001) and glaucoma (p = 0.0004). Table 1 summarizes the significant associations.

Table 1: Significant Associations Between Demographic Factors and Ocular Morbidities:

Parameter	Category	Age in years				Gender			Literacy status		
		60-69	70-79	≥ 80	Total	Male	Female	Total	Literate	Not literate	Total
Cataract	Yes	11	43	9	64	18	46	64	42	22	64
	No	04	40	15	58	11	47	58	42	16	58
	Total	15	83	24	122	29	93	122	84	38	122
	P value	0.029				0.2353			0.4187		
URE[1]	Yes	06	22	15	43	11	32	43	11	32	43
	No	09	61	09	79	18	61	79	73	05	79
	Total	15	83	24	122	29	93	122	84	38	122
	P value	0.0011				0.7288			0.0001		
AMRD[2]	Yes	02	05	08	15	4	11	15	12	03	15
	No	13	78	16	107	25	82	107	72	35	107
	Total	15	83	24	122	29	93	122	84	38	122
	P value	0.0003				0.7528			0.3872		
Glaucoma	Yes	05	04	02	11	3	8	11	02	09	11
	No	10	79	22	111	26	85	111	82	29	111
	Total	15	83	24	122	29	93	122	84	38	122
	P value	0.0004				0.7217			0.0004		
DR[3]	Yes	02	03	02	07	2	5	07	05	02	07
	No	13	80	22	115	27	88	115	79	36	115
	Total	15	83	24	122	29	93	122	84	38	122
	P value	0.1075.				0.67			1.0000		

URE[1:] Uncorrected refractive errors and presbyopia

AMRD[2:] Age related macular degeneration

DR[3:] Diabetic Retinopathy

Discussion

The results of this study highlight the high prevalence of ocular morbidity among elderly residents in old age homes in sub-urban areas around Ramanagara.

Cataract was the most common ocular morbidity, affecting more than half of the participants. This finding is consistent with previous studies that have reported cataract as the leading cause of visual impairment and blindness in the elderly.[7] The prevalence of cataract was highest among those aged 70-80 years, which aligns with the natural progression of cataract formation with age.[8] It is observed that most of the patients had cataract in one eye and pseudophakia in the other eye. Patients were reluctant for cataract surgery on the second eye

in our study population if the Best Corrected Visual Acuity was better than 6/18 in the pseudophakic eye. Another study on the rural Chinese population made similar observations.[9]

Visual impairment (less than 6/18) was present in 42.6% of the total eyes in our cohort. One of the major studies in South India on the institutionalised elderly population in a rural area reported that visual impairment (VI) was present in 56.9% of the individuals. Over 80% of the VI was due to avoidable causes including cataract (57.1%) and uncorrected refractive errors (26.4%).[10] The same group conducted the study in an urban locality and reported that 52% of the elderly residents residing in old age homes had bilateral presenting Visual Acuity of 6/12 or worse, and nearly one-third had bilateral presenting vision worse than 6/18.[11] The prevalence of VI among senior citizens receiving residential care in Singapore and Australia, according to the <6/12 criterion, was 46.4% and 41.5%, respectively.[12, 13]

In India, the prevalence of refractive errors such as myopia and hypermetropia is 53.1%. Among individuals aged above 50 years, 10.2% experience visual impairment and blindness due to refractive errors, a figure significantly higher than the global estimate of 5.7%. Additionally, the study found that nearly one-third of adults in the country suffer from uncorrected presbyopia.[14] In our study, refractive errors and uncorrected presbyopia were the second most common ocular morbidity, together affecting one-third of our study participants.

This is a concerning finding, as uncorrected refractive errors can significantly impact the quality of life of the elderly. They spend their leisure time in near-work activities and it also results in lost productivity.[15] The higher prevalence of refractive errors among those with no formal education seen in our study suggests that educational level may influence access to and awareness of corrective lenses and glasses.

Older age is an independent risk factor for age-related macular degeneration (ARMD). ARMD is estimated to affect 1.4–3.1% of people living in India, and its prevalence is expected to increase in the years to come. [16, 17] 12.3% of our study population had ARMD changes. Out of fifteen individuals, ten of them had early ARMD and three elderly individuals who were suspected to have wet ARMD were referred to the base hospital, evaluated by a retina specialist, and the diagnosis was confirmed. A large population, hospital-based study in Maharashtra noted the overall proportion of ARMD to be 1.38%. (ARMD - 1.34% and late ARMD - 0.37%).[17] They evaluated individuals aged above 50 years, whereas we studied elderly more than 60 years. We also observed that age was significantly associated with the prevalence of cataract ($p < 0.001$) and ARMD ($p = 0.012$).

Glaucoma is the third most common cause of blindness in India but a leading cause of irreversible blindness. Nine percent of our participants had glaucoma, which varied from chronic simple glaucoma to neo-vascular glaucoma. The diagnosis was made at the base hospital after a complete evaluation. The previous research showed the prevalence of glaucoma in people forty years of age to be from 6.9% to 8.1%. Furthermore, as glaucoma and aging are closely related, the number of glaucoma patients would rise over time, especially given India's rapid demographic change. The National Program for Control of Blindness and Visual Impairment has up till now prioritized cataract blindness prevention. Effective measures must be taken to control glaucoma-related blindness in conjunction with the cataract-driven approach.[18]

Diabetic retinopathy (DR) affected 5.7% of our participants. A major study - SMART India population-based cross-sectional screening study estimated that national prevalence was 12.5% for diabetic retinopathy and four percent for Vision threatening DR, with no significant differences between urban and rural population.[19] Diabetic retinopathy is a serious complication of diabetes, and regular ophthalmic examinations are essential for early detection and management to prevent vision loss.

Educational level was significantly associated with uncorrected refractive errors and glaucoma, suggesting that educational interventions and health literacy programs may help in reducing the burden of these conditions

Chronic diseases, particularly hypertension and diabetes mellitus, were associated with a higher

prevalence of ocular morbidities. This underscores the importance of integrated health care services that address both systemic and ocular health issues. Regular monitoring and management of chronic diseases can help in reducing the risk of ocular complications.[20]

The high prevalence of ocular morbidity among the elderly in old age homes highlights the need for regular eye care services and comprehensive health programs.

Access to ophthalmic care is often limited in sub-urban areas, and the elderly in these settings may face additional barriers such as transportation, financial constraints, and lack of awareness. Mobile eye care units and community-based screening programs can play a crucial role in addressing these barriers and improving access to eye care services. Old age homes in Karnataka face a mix of financial challenges and support.Many facilities depend on government programs to help its elderly residents financially, such as the Indira Gandhi National Old Age Pension Scheme (IGNOAPS) and the state's Sandhya Suraksha Yojane (SSY). These programs seek to provide impoverished and destitute elderly people with a basic level of financial assistance.We also observed that organisations which depended on government aids had a higher magnitude of ocular morbidity than the private institutions.

Conclusions

There is a noticeable gap in data concerning the healthcare of elderly individuals residing in old age homes nationwide. Ocular morbidity is a significant health issue among the elderly, and the findings of this study emphasize the need for customary eye care services in old age homes in sub-urban areas. Cataract, refractive errors, ARMD, glaucoma, and diabetic retinopathy are common ocular morbidities affecting the elderly in these settings. Age, educational level, lifestyle, and chronic diseases are important factors influencing the prevalence of these conditions.The study has a few limitations. The study was conducted in a limited geographic area, which may affect the generalizability of the findings. Despite thelimitations, the study provides valuable insights into the ocular health status of the elderly in old age homes in sub-urban areas. The use of detailed ophthalmic examinations and a semistructured questionnaire ensures the reliability and validity of the findings.

Enhancing access to comprehensive eye care services, including corrective measures such as spectacles, surgical interventions for cataracts, and treatments for other ocular conditions, is essential to improve the visual health of elderly residents. Health policies and interventions should focus on improving access to eye care services, promoting health literacy, and encouraging physical activity among the elderly to reduce the burden of ocular morbidity.

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Ethical Clearance: The study is approved by the INSTITUTION ETHICS COMMITTEE (CDSIMER-IEC, Regn. ECR/1628/INST/KA/2021)

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Conflicts of interest: NA

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