

PREVALENCE OF VISUAL IMPAIRMENT AND PATTERN OF OCULAR MORBIDITY AMONG INMATES IN A SPECIAL CARE WARD FOR ELDERLY CITIZENS.

Ophthalmology

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ABSTRACT

Background: Visual Impairment (VI) and blindness are strongly associated with aging and late life disability. A large proportion of this VI is avoidable. This study was done to estimate the prevalence of VI and pattern of ocular morbidity among inmates in a special care ward for elderly citizens in a tertiary care hospital. **Methods:** A hospital-based cross-sectional study was conducted among 72 patients. A questionnaire including sociodemographic profile, systemic conditions and detailed ocular history was collected. Distant visual acuity was assessed and VI was graded according to WHO classification(2018) into mild(<6/12to6/18), moderate(<6/18to6/60), severe(<6/60to3/60) and blindness(<3/60). Anterior segment examination, intra ocular pressure(IOP) measurement, Dry eye disease(DED) evaluation and dilated fundus examination was done.

Results: Mean age was 70.7 years. 66.7% were females. The prevalence of VI was 83.3%, majority of them having moderate VI. The leading cause of VI was Cataract (81.9%) in all the categories of VI followed by Diabetic Retinopathy(DR) in moderate and severe VI and Age Related Macular Degeneration(ARMD) in mild VI. 58.3% had only primary level of education. 87.5% of the patients belonged to a low socioeconomic status. 38.9% had not been visited by their relatives in over an year. 31.9% had their previous ocular examination over an year ago. Type 2 Diabetes Mellitus(T2DM) (66.7%), Dyslipidaemia(DLP) (31.9%), Systemic Hypertension(SHTN) (45.8%) and Heart disease (5.56%) were the comorbidities. 61.11% had DED, 29.2% had DR, 36.1% had ARMD, 19.4% had Hypertensive Retinopathy(HTNR) and 2.8% had Glaucoma.

Conclusions: Prevalence of VI was found to be 83.3%, majority being moderate category. Cataract was found to be the leading cause of ocular morbidity which is a treatable cause of VI. Educating elderly people and their caregivers about common eye conditions, importance of preventive measures and early treatment will help in preventing ocular morbidity.

KEYWORDS

visual impairment, elderly citizens, cataract

INTRODUCTION

Fast growing demographic transition towards elderly population has resulted in issues posing social, financial and healthcare challenges. Neglect of the elderly is a growing problem, driven by diverse factors such as rapid urbanization, the prevalence of nuclear family structures, children relocating to other countries, poverty, and a lack of concern(1). Elderly are often economically and socially dependent, suffering from the dual burden of communicable and non-communicable diseases besides impairment of vision, hearing and cognitive functions(2).

Over 250 million people are visually impaired globally with 80% of them being 50 years of age or older(3). India has 104 million older people(>60 years), constituting 8.6% of total population(4). Previous researches indicate that elderly individuals residing in residential care or institutional settings have a higher likelihood of experiencing VI(5-9). With relatively simple interventions, a large proportion of this VI is avoidable(preventable, treatable or correctable)(10,11). Aim of this study was to estimate the prevalence of VI and pattern of ocular morbidity among inmates in a special care ward for elderly citizens in a tertiary care hospital.

MATERIALS AND METHODS

A hospital-based cross-sectional study was conducted in a special care ward for elderly citizens in a tertiary care hospital. 144 eyes of 72 patients were examined after taking informed written consent. A detailed history including sociodemographic profile such as age, gender, level of education, occupation previously involved, socioeconomic status, marital status, number of children and frequency of visit by them or relatives were collected using a questionnaire. Data were also collected on risk factors such as smoking and alcohol consumption and about systemic conditions such as T2DM, SHTN, DLP and Heart disease. Duration since previous ocular examination and any specific ocular history was also noted. Distant visual acuity of each eye was assessed using Snellen chart. VI was defined as presenting visual acuity worse than 6/12 in the better eye

and was graded according to WHO classification(2018) as mild(VA <6/12 to 6/18), moderate(VA <6/18 to 6/60), severe(VA <6/60 to 3/60) and blindness(VA <3/60). Anterior segment examination was done using torch light. Intra ocular pressure(IOP) measurement was done using Schiotz tonometer. Dry eye evaluation was done using Schirmer strips(Whatman filter paper number 41). Dilated fundus examination was done using indirect ophthalmoscope with +20 Dioptre lens.

Data were presented as frequencies and percentages, with statistical significance assessed using p-values. A p-value threshold of <0.05 was used to identify significant relationships. Sociodemographic data and ocular and systemic conditions were compared across different levels of VI, ranging from no impairment to blindness. Data analysis was performed using "jamovi 2.5.3".

RESULTS

72 participants were included in the study. Mean age of the study group was 70.7 years (SD 10.29 years; range: 51-98 years). The distribution across age categories showed that the largest proportion of patients(41.7%) were aged between 61-70 years. 66.7% were females. Table-1 shows the sociodemographic profile of the study participants.

Table-1: Characteristics Of Participants Examined

	Frequency (percentage, n=72)
Age in years	
51-60	11(15.27%)
61-70	30(41.7%)
71-80	19(26.4%)
>80	12(16.7%)
Sex	
Male	24(33.3%)
Female	48(66.7%)
Occupation	
Nil	38(52.8%)
Skilled	7(9.7%)

Manual labour	27(37.5%)
Education	
Primary	42(58.3%)
Secondary	19(26.4%)
Higher secondary	10(13.9%)
Graduate	1(1.4%)
Socioeconomic status	
Low	63(87.5%)
Middle	8(11.1%)
High	1(1.4%)
Marital status	
Unmarried	12(16.7%)
Married	60(83.3%)
Number of children	
Nil	27(37.5%)
1	21(29.2%)
2-3	14(19.4%)
Visit by relatives	
1 month	9(12.5%)
1-3 months	14(19.4%)
3-6 months	18(25.0%)
6-12 months	3(4.2%)
>1 year	28(38.9%)
Addictions	
Nil	49(68.1%)
Alcohol	4(5.6%)
Smoking	3(4.2%)
Alcohol + smoking	16(22.2%)
Spectacle usage	
No	62(86.1%)
Yes	10(13.9%)

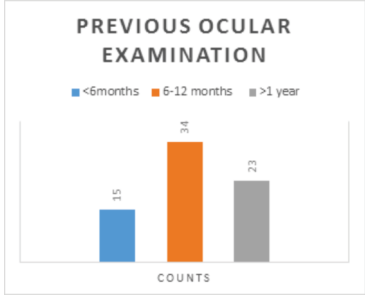


Figure-1: Previous Ocular Examination Of Study Participants

Nearly half of the patients(47.2%) had their previous ocular examination between 6-12 months ago, while 31.9% had it over 1 year, and 20.8% had an eye exam in the past 6 months (Figure-1)

Out of 72 subjects, 66.7 % had Type2 DM, 31.9% had DLP,45.8% had SHTN and 5.56% had heart disease.

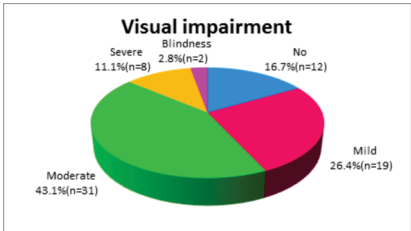


Figure-2: Categories Of VI (n=72) Among The Elderly

The prevalence of VI was 83.3%(n=72).26.4%(n=19) had mild VI, 43.1%(n=31) had moderate VI, 11.1%(n=8) had severe VI and 2.8%(n=2) had blindness.

Among the study population, 81.9% had cataract. 37.5% had undergone cataract surgery. 29.2% and 36.1% had DR and ARMD respectively.

Table-2 shows the frequency of ocular morbidities among the elderly.

Table-2: Frequency Of Ocular Morbidities

OCULAR MORBIDITY	YES	NO
Lids and lacrimal apparatus		

Ptosis	22(30.6%)	50(69.4%)
Ectropion/entropion	2(2.8%)	70(97.2%)
Dacryocystitis	11(15.3%)	61(84.7%)
Blepharitis	17(23.6%)	55(76.4%)
Conjunctiva		
Pinguecula	11(15.3%)	61(84.7%)
Papillae	21(29.2%)	51(70.8%)
Concretion	23(31.9%)	49(68.1%)
Pterygium	12(16.7%)	60(83.3%)
Cornea		
Corneal opacity	4(5.6%)	68(94.4%)
Arcus senilis	65(90.3%)	7(9.7%)
Iris and pupil		
Iris atrophy	25(34.7%)	47(65.3%)
Corectopia	1(1.4%)	71(98.6%)
Lens		
Cataract	59(81.9%)	13(18.1%)
Pseudophakia	27(37.5%)	45(62.5%)
Glaucoma	2(2.8%)	70(97.2%)
Dry eye evaluation		
(Schirmer 1) RE	35(48.61)	37(51.4%)
(Schirmer 1) LE	38(52.8)	34 (47.2%)
Squint	3(4.2%)	69(95.8%)
Posterior segment		
Tessellated background	38(52.8%)	30(41.7%)
DR	21(29.2%)	45(62.5%)
ARMD	26(36.1%)	40(55.6%)
HTNR	14(19.4%)	52(72.2%)

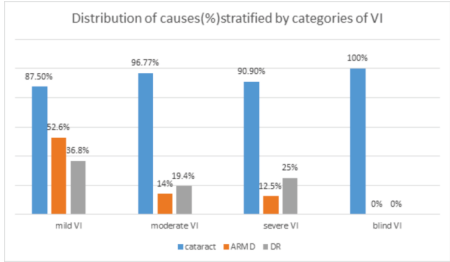


Figure-3: Distribution Of Causes Stratified By Categories Of VI

Cataract was the leading cause of VI(81.9%)in all categories of VI. Second common cause was ARMD among mild VI, while DR was the second common cause of VI in moderate and severe VI category (Figure-3).If there were different causes of VI in both the eyes, the predominant cause that was likely to increase the VI was taken in to consideration.

On determining the association of VI with sociodemographic characteristics and ocular morbidities, statistically significant association (p <0.05) was found with increasing age, cataract, DR, ARMD and HTNR(Table-3).

Table-3: Association Of Vi With Sociodemographic Characteristics And Ocular Morbidities.

	No (n=12)	Mild (n=19)	Moderate (n=31)	Severe (n=8)	Blindness (n=2)	p value
Age in years						0.002
Mean (SD)	62.5(7.6)	68.2(9.1)	72.9(10.3)	79.2(9.9)	74(2.8)	
Range	51.0-70.0	51.0-91.0	53.0-98.0	64.0-93.0	72.0-76.0	
Age in years						0.023
51-60	3(25.0%)	4(21.1%)	3(9.7%)	0(0.0%)	0(0.0%)	
61-70	8(66.7%)	8(42.1%)	12(38.7%)	2(25.0%)	0(0.0%)	
71-80	0(0.0%)	6(31.6%)	9(29.0%)	2(25.0%)	2(100%)	
>80	0(0.0%)	1(5.3%)	7(22.6%)	4(50.0%)	0(0.0%)	
Previous eye Examination						0.907

<6 months	2(16.7%)	4(21.1%)	5(16.1%)	3(37.5%)	1(50.0%)	
6-12 months	6(50.0%)	9(47.4%)	15(48.4%)	3(37.5%)	1(50.0%)	
>1 year	4(33.3%)	6(31.6%)	11(35.5%)	2(25.0%)	0(0.0%)	
Cataract						<0.001
No	9(81.81%)	2(12.50%)	1(3.22%)	1(1.09%)	0(0.0%)	
Yes	2(18.18%)	14(87.5%)	30(96.77%)	10(90.90%)	3(100.0%)	
Corneal opacity						0.681
No	12(100%)	18(94.7%)	28(90.3%)	8(100.0%)	2(100.0%)	
Yes	0(0.0%)	1(5.3%)	3(9.7%)	0(0.0%)	0(0.0%)	
Squint						0.010
No	12(100%)	19(100%)	30(96.8%)	7(87.5%)	1(50.0%)	
Yes	0(0.0%)	0(0.0%)	1(3.2%)	1(12.5%)	1(50.0%)	
DR						<0.001
No	6(50.0%)	12(63.2%)	25(80.6%)	2(25.0%)	0(0.0%)	
Yes	6(50.0%)	7(36.8%)	6(19.4%)	2(25.0%)	0(0.0%)	
ARMD						<0.001
No	11(91.7%)	12(63.2%)	17(54.8%)	3(37.5%)	0(0.0%)	
Yes	1(8.3%)	10(52.6%)	14(45.2%)	1(12.5%)	0(0.0%)	
HTNR						<0.001
No	10(83.3%)	17(89.5%)	22(71.0%)	3(37.5%)	0(0.0%)	
Yes	2(16.7%)	2(10.5%)	9(29.0%)	1(12.5%)	0(0.0%)	

The prevalence of Type2 DM was generally higher in those with any level of VI compared to those without but it was not statistically significant. Among patients with severe VI, 87.5% had Type2 DM, while all patients who were blind had Type2 DM. DLP and SHTN were more common among patients with moderate VI(41.9%) and severe(75%)VI respectively.

DISCUSSION

While aging is a natural process that presents both opportunities and challenges, older individuals remain a crucial and valuable resource for any society. Aging significantly increases the risk of VI and blindness, which can contribute to late-life disability (12).

In our study, the prevalence of VI was 83.3%. Majority of them (43.1%) had moderate VI. Cataract was the leading cause of VI(81.9%) in all the categories which was statistically significant. Second common cause was DR in moderate and severe VI, and ARMD in mild VI.

A study by Srinivas Marmamula et al found a 30.1% prevalence of VI among 1182 elderly residents above 59 years in 'homes for the aged'(11). Similar to our study majority had moderate VI(23.6%) followed by severe VI in 3.2%. In our study, Blindness was seen in 2.8% compared to 3.3% in their study. Similar to our study, the leading cause of VI was found to be cataract(46.4%). The second common cause in their study was uncorrected refractive error(27%) where as it was DR in our study. According to the Longitudinal ageing study in India among individuals aged 45 years and older residing in households, 33.8% had VI or blindness (12).

An epidemiological study conducted by Pisudde PM et al in Wardha, Maharashtra found a prevalence of 5.4% blindness among 974 participants of 50 years or older, refractive error being the most common cause(13). Proportion of cataract was 36.3%, which was less compared to our study. The prevalence of VI was 43.70% in a study conducted by Mahesh Kumar Dev et al(14). Cataract was found to be the most common cause of VI followed by ARMD.

VI and blindness was seen in 30% and 8% individuals respectively, most common cause being cataract, in a study conducted by Vibha Florence Baldev et al(15). Other common causes were corneal opacity and glaucoma which was contrary to our study.

Age was having a statistically significant positive correlation with VI in all the studies including ours(11-14). We couldn't find a significant association between gender and VI which was similar to several other studies (11,14,15).

In our study, most patients across all levels of VI came from a low socio-economic background but it was not statistically significant. In other studies, there was a statistically significant association (12,13,16). This highlights the disparity in access to eye care services among different socio-economic groups, as patients with limited

resources are often unable to seek timely treatment for preventable eye diseases.

In our study, there was no statistically significant association between VI and education which was contrary to other studies(11,13). In the study by Srinivas Marmamula et al, compared to those with no formal education, those with school education or higher education had lower odds of VI(11).

31.9% from our study had their previous ocular examination more than 1 year ago. Study by Mahesh Kumar Dev et al found that, about 35% of the residents had no history of eye examination during their life time (14).

Prevalence of DED in the study by Pisudde PM et al was 12.7% which was less compared to our study(61.11%)(13). In our study, DR(29.2%), ARMD(36.1%) and HTNR showed a statistical significant correlation with VI. DR was present in only 8.9% in the study by Pisudde PM et al. In the study Vibha Florence Baldev et al, ARMD was present in only 6.6% of study population. In our study, glaucoma was seen in only 2.8% compared to 5.6% and 11.1% in other studies.(13,15) In our study, the prevalence of diabetes was generally higher in those with any level of visual impairment compared to those without, but was not statistically significant. A statistically significant association was found in some other studies(11,12)

These findings underscore the need for integrated healthcare approaches that address systemic conditions like T2DM, alongside regular eye examinations to manage and prevent visual deterioration.

This study also had some limitations. As the study was conducted in special care ward (institutional) inmates, generalisation of the findings to the elderly population in residential care and those in old age homes would be questionable. Small sample size was also a limitation of our study. A study with large sample size would help us to understand much more about the ocular morbidities and visual challenges faced by the elderly citizens.

Lubricant eye drops were given to the elderly with Dry Eye Disease. Follow up visits were done. Awareness about cataract surgery was explained to those in need. Awareness regarding the control of systemic comorbidities and frequent ocular examinations in preventing further vision loss was explained.

CONCLUSION:

Prevalence of VI was found to be 83.3%, majority belonging to moderate category. Cataract was the most common cause of VI which is treatable. Addressing the socio-economic barriers to healthcare access is crucial for ensuring that vulnerable populations receive the eye care they require. Lack of frequent eye examination may be one of the major reasons for increased VI and other ocular morbidities. Implementing routine vision screening by Mobile ophthalmology unit and Teleophthalmology would ensure access to ocular examination in old age homes by trained ophthalmologists and optometrists which would help in early intervention and management. Educating elderly people and their caregivers about common eye conditions, importance of preventive measures and early treatment will also help in preventing ocular morbidity.

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