

The Dimensions of Ocular Morbidity Amongst The Nursing Home Geriatrics Population

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Summary

A cross-sectional prevalence study amongst a nursing home elderly population was carried out at Rumah Sri Kenangan, Seremban, Negeri Sembilan between June 1995 until June 1996. A total of 204 cases of 60 years and older were examined in order to determine the ocular morbidity amongst them. It was found that 47.5% had low vision and 19.1% were legally blind. Cataract was found to be the leading cause of low vision and blindness occurring in 81.4% and 74.3% respectively. Glaucoma occurred in 1% of those who had low vision and none due to macular degeneration or diabetic retinopathy. The magnitude of visual impairment and blindness in this nursing home is high but is preventable and avoidable.

Key Words: Low vision, Blindness, Cataract, Glaucoma, Diabetic retinopathy, Macular degeneration

Introduction

In Malaysia, by the year 2020 those aged 65 and above will constitute about 7% of the estimated total population of 32 million.¹ Increasing age is accompanied by higher rates of blindness and eye disease.² Blindness and low vision in the elderly is a major problem as their visual status plays a significant role in the quality of their lives. The prevalence of blindness increases with an exponential increase after the age of 40 years.³ It was found that one out of three individuals would have some form of vision reducing disease by the age of 65.⁴

Nursing home residents, as compared to community-dwelling persons of the same age from the same population, have a dramatically higher prevalence of blindness. In the Baltimore Nursing Home Eye Survey, the prevalence of blindness was 17.0% and 18.8% were visually impaired.⁵ As compared to the non-institutionalised population from the same communities, the rate

of blindness among nursing home residents was 13.1 times higher for blacks and 15.6 times higher for whites. Cataract was the leading cause of blindness, followed by corneal opacity, macular degeneration and glaucoma.⁷ In the Beaver Dam Eye Study the rates of visual impairment and legal blindness of people in nursing home were 63.9% and 8.3% respectively, significantly higher than those who are not institutionalised. From their observations, the authors concluded that the frequency of visual impairment and legal blindness were highest in persons 85 years of age or older especially in those living in the nursing home and rehabilitation centres.⁶

The facts and figures quoted above demonstrate the need of exploring the ocular status in local nursing home residents, indeed this is to discover whether we are facing a similar or better situation. The aims of this study were to determine the prevalence of visual impairment and blindness and the ocular diseases amongst the

elderly people in a nursing home. Visual impairment and blindness is defined based on the World Health Organization's classification.⁷

Methods

This cross-sectional study was conducted from June 1995 until June 1996 amongst all elderly people of the Rumah Sri Kenangan aged 60 years and above. A total of 204 out of 220 residents participated in the study. The biodata of the cases were obtained from the nursing home registry. Those who were included in this study were interviewed regarding their social background, ophthalmic and medical histories.

Ophthalmological examinations were then performed. The distant visual acuity was measured with their best correction using the letter optotype Snellen chart. The illiterates were tested using the 'illiterate' or 'tumbling E' chart at 6 metre distance. The best corrected visual acuity of the two eyes was established starting with the right followed by the left. An occluder was used to ensure proper occlusion and they were instructed to read the smallest letters on the chart. Those who could not read the biggest letter were brought closer to the chart. Counting fingers was recorded if visual acuity was less than 3/60. Hand movement and perception of light were recorded if the visual acuity was less than counting fingers and hand movement respectively. Those whose visual acuity could not be tested were classified as believed not to be blind if they could walk about and believed to be blind if they could not walk about due to poor vision.

To determine whether the cases have refractive error, visual acuity were tested using a pin-hole. Refractive error was considered present if there was improvement of visual acuity by using pin-hole. Slit-lamp biomicroscopic examination of the anterior and posterior segments was carried out. The morphology of cataract when present was classified as nuclear sclerosis, cortical, posterior subcapsular and mixed. The intraocular pressure was measured using the Goldmann applanation tonometer. The pupils were dilated with guttae tropicamide 1% and guttae phenylephrine 2.5% for examination of the posterior segment. The ocular findings were recorded, and the diagnosis of visual

impairment and blindness was made. Possible aetiologies were ascertained and those who were found to have refractive errors were refracted by the optometrist. Some cases were referred to the state ophthalmologist for further investigations such as phasing of intraocular pressure, visual field examination, fundus fluorescein angiography or for surgical intervention if indicated. To determine the association of prevalence of visual impairment and blindness with the study factors, Chi-square tests were performed.

Results

Demographic Characteristics

Two hundreds and four residents who met the inclusion criteria were included in this study from a total of 220 inmates. There were 129 (63.2%) men and 75 (36.8%) women. The majority of cases were Indians 83 cases; (41%), Chinese constituted 61 cases; (30%), Malays formed 53 cases; (26%) of the residents and others 7 cases; (3%). The age distribution ranged from 60 to 95 years. The mean age of the total cases was 71.5 ± 8.6 years and for men and women mean age was 71.5 ± 8.0 and 71.4 ± 9.7 respectively. There were 96 cases (47%) in the group of 60 - 69 years of age, 68 (33.4%) in the group 70 - 79 years, 32 (15.7%) in the group of 80 - 89 years and 8 (3.9%) in the group of more than 90 years.

Level of Visual Acuity

Visual acuity testing using Snellen chart was performed in 184 cases. The other 20 cases could not co-operate or appreciate the test because of mental disorders such as Schizophrenia and dementia. Their visual acuity was tested subjectively and classified as believed not blind or believed blind based on their ability to walk about. The levels of visual acuity were classified into group 1 (good vision): 6/5 - 6/12; group 2 (visual impairment): 6/18 - 3/60 and group 3 (blind): <3/60; group 4; those who were believed not blind and group 5: those who were believed blind.

There were 42 (20.7%) cases who had visual acuity of 6/5 - 6/12 (group 1) in the right eye and 43 (21.0%) in the left eye. Ninety-four (46.1%) had visual acuity of 6/18 - 3/60 (group 2) in the right and 86 (42.1%) in the left. Blindness (group 3) in the right eye could be seen

in 48 (23.5%) cases and in the left eye in 55 (27.0%). Those who were believed not to be blind (group 4) in either eyes comprised of 20 (9.8%) however, none of the cases who were tested subjectively were believed to be blind (group 5). When the visual acuity of the better eye was considered, 48 (23.5%) had good vision (group 1), 97 (47.5%) were visually impaired and 39 (19.1%) were blind. This is illustrated in Figure 1.

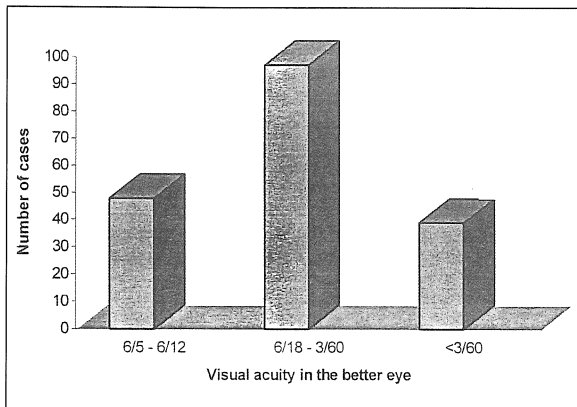


Fig. 1: Distribution of cases according to visual acuity of the better eye

Prevalence of Visual Impairment and Blindness

There were 97 cases whose visual acuity in the better eye was between 6/18- 3/60 and 39 who were blind (<3/60). Thus, the prevalence of visual impairment and blindness was 47.5% and 19.1% respectively.

Prevalence of Visual Impairment and Blindness According to Gender, Age Groups and Race

There were more men who were visually impaired than women. The prevalence of visual impairment amongst men and women was 30.9% and 16.7%. Despite the higher prevalence of visual impairment in men, this difference was however statistically insignificant (chi-square: 0.233, $p = 0.629$).

In our study, it was found that men were more prevalent to be blind as compared to women. The prevalence of blindness was 11.8% in men and 7.4% in women. This again was found to be statistically insignificant

(chi-square: 0.06, $p = 0.807$). Therefore in our study, it was found that there was no association between gender and the incidence of visual impairment or blindness ($p > 0.05$).

The majority of the cases (41: 20.1%) who were visually impaired were in the 70 - 79 year age group. Only 3 (1.5%) of the 90 years and more age group were visually impaired. It was found that there was a strong association between age and visual impairment ($p < 0.05$). However, given the larger number of cases in the latter age group, the trend of increasing prevalence of blindness with increasing age is observed.

The majority of cases in this study were Indians. It was found that there was high prevalence of visual impairment and blindness amongst them, however it was found that visual impairment and blindness was not associated with race (chi-square: 3.167, $p = 0.367$ and 1.208, $p = 0.7511$ respectively).

Causes of Visual Impairment and Blindness

There were 97 cases that were visually impaired. Out of these, 79 (81.4%) were found to have cataract followed by refractive error in 8 (8.2%), and uncorrected aphakia in 6 (6.2%). Glaucoma was found in 1 case (1%), none were visually impaired from diabetic retinopathy and age related macular degeneration. Other causes of visual impairment were optic atrophy, in 2 (2.1%) and a pigimentary disorder in 1 (1%).

Cataract causes blindness in 29 out of 39 cases (74.3%). Fifteen point four percent of the cases (6 cases) had bilateral phthisis bulbi and 2 (5.1%) each had refractive errors and corneal opacity as the cause of blindness.

Eye Diseases

Phthisis bulbi was not uncommon and was found in 7 cases (3.4%) in either the right or left eye and 6 cases (3%) had bilaterally. Only 2 cases (1%) had an absent globe. One of the cases (0.5%) had ectropion, however entropion was present in 8 cases (4.0%). There were 24 (11.8%) cases with corneal opacities in both eyes, however they could not definitely identify the causes of the corneal opacity, neither could it be determined from the clinical examination.

Pterygium was present in 9 cases (4%) in either right or left eye but not severe enough to cause any significant visual problem. In the right eye there were 5 (2.5%) cases who were either aphakic or pseudophakic. Cataract was present in 155 cases (76.3%) in the right eye and 154 cases (75.9%) in the left. Nuclear sclerosis was seen in 94 cases (46.3%) and 93 cases (45.8%) in the right and left eye respectively. The total prevalence of cataract was 75.7%.

The prevalence of diabetic retinopathy was found in 5 cases (2.5%), comprising only background changes, which did not, cause visual impairment or blindness. Glaucomatous optic discs cupping was noted in 11 (5.5%) eyes, only 2 cases (1%) of which had raised intraocular pressure and visual field changes. There was no other case of glaucoma. None was found to have age related macular degeneration, however drusen were noted in 7 (3.5%) cases in both eyes but vision was not affected. Pigmentary changes of the retina were seen in 11 eyes (5.5%). Signs of an old venous occlusion was seen in 1 (0.5%) eye and myopic changes were present in 3 eyes (1.5%). There were 3 cases (1.5%) who had optic atrophy in either eye, however, a definite history as to the cause of optic atrophy could not be obtained.

Discussion

This cross sectional study was conducted to document the magnitude of visual impairment, blindness and eye diseases amongst the elderly in a nursing home. Such data are useful in estimating the need for medical eye care counseling and rehabilitative services, projecting costs, measuring temporal trends, and measuring quality of life. The prevalence of visual impairment and blindness amongst the geriatrics patients of this nursing home was found to be 47.5% and 19.1% respectively. This means that almost half of the residents were visually impaired. The appalling magnitude of blindness is alarming and considering that it occurs amongst institutionalised residents. The prevalence observed is comparable to that observed in the western countries.

In the Beaver Dam Eye study, a population-based eye survey amongst the population living in the city and township of Beaver Dam, Wisconsin, United States of

America conducted from September 1987 until May 1988 it was found that the prevalence of visual impairment and legal blindness was 5.2% and 0.5% respectively.⁶ This study included 52 cases residing in a nursing home and found the rate of visual impairment and blindness there was 63.9% and 8.3% respectively. In comparison, the prevalence of blindness in our current study was doubled but the prevalence of visual impairment was lower.

The authors of the Beaver Dam Eye study also compared the rate of visual impairment and blindness amongst those residing in the nursing home to those who were not. They found that those living in the nursing home were 3.3 times more likely to have visual impairment and 4.9 times more likely to be legally blind than those not residing in the nursing home. This was because the placement in the nursing home was due to visual impairment and blindness and thus contributed to the higher rates.⁶

The largest and most comprehensive study on visual status amongst the nursing home population ever conducted to date is the Baltimore Nursing Home Eye Survey. It was carried out over almost two years period from February 1988 until September 1989. The aims were to determine the prevalence of visual impairment and blindness and the associated ocular diseases amongst 499 participants of 34 nursing homes who had previously lived in the community in East Baltimore. In this survey two definitions of visual impairment and blindness were used. The first definition used as commonly applied in the United States of America is best corrected visual acuity in the better eye of less than 20/200 for blindness, and 20/40 - 20/200 for visual impairment. The second definition was according to the World Health Organization as in this study. It was found that the prevalence of visual impairment and blindness based on the first definition was 18.8% and 17.0% respectively. However based on the World Health Organization definition of visual impairment and blindness the prevalence of visual impairment and blindness were 23.1% and 7.4% respectively.⁵

Both the prevalence of visual impairment and blindness observed in the Baltimore Nursing Home Eye Survey were lower than this present study, however comparison could not be made because the cases selected in the

Baltimore Nursing Home Eye Survey included a younger age group (40 years of age or older). The authors found that there was a small peak in the prevalence of blindness among subjects 40 to 59 years of age, followed by an increasing prevalence with older ages up to as high as 28.6% among those 90 years of age or older, which was more than double the rate among those in their 60s. Bilateral visual impairment was also found to be common in the Baltimore population, with rates rising from 10.9% in the youngest age group to 26% among those 90 years of age or older.⁵

The survey conducted by Whitmore in 1989 was much alike to this present one. The character of the nursing home, number of cases and the age group were very similar. Whitmore studied the eye diseases amongst the geriatrics in a single non-profit-making skilled nursing home in New York City maintained under the auspices of the Catholic Church, with a sample size of 225, aged 65 and above. From his study, the author found 30% of the cases were legally blind whilst 44% had visual acuity of 20/40 or better in at least one eye.⁸ The prevalence of blindness was almost doubled compared to this study.

In the Blue Mountains Eye Study, a population-based survey conducted in two postcode areas west of Sydney amongst 128 persons aged 50 or older, 8% were found to be blind (less than 6/60). Moderate visual impairment (6/24 - 6/60) was seen in 22% and mild impairment (6/12) in 28% of cases. They also found that the nursing home residents were five times more likely to be blind than community residents.⁹

The leading cause of visual impairment and blindness found in our study was cataract accounting for 79 (81.4%) and 29 cases (74.3%) respectively. As mentioned above, this was associated with the aging process and these findings were almost consistent with the study conducted by Whitmore. The prevalence of cataract in his study was 81%⁸ and in the Blue Mountain Eye Study, 70% of bilaterally blind residents had cataract in at least one eye as compared to the Baltimore Nursing Home Eye Survey where cataract was found to cause blindness in 27.1% of cases.

The next commonest causes of visual impairment in this study were refractive error followed by uncorrected

aphakia which were found in 8.2% and 6.2% of cases respectively. Refractive error also caused blindness in 5.1% of cases. In the Baltimore Eye Survey, uncorrected refractive error was found to be an important source of visual impairment and the authors found that adequate refractive correction reduced the prevalence of blindness by 20% and of visual impairment by 37%.³

The prevalence of glaucoma as a cause of visual impairment in our study was low, occurring only in 1% of cases in contrast to the Baltimore Nursing Home Eye Survey (10%) and the Blue Mountains Eye study (10.4%).^{3,9} Newell and co-worker conducted visual acuity and glaucoma screening involving 604 cases from 19 nursing homes in Western Oklahoma in 1985 whereas here were 15.8% of cases who had IOP more than 24mmHg as compared to the general community (2.56%).¹⁰ The incidence was high, because many of the nursing home cases especially those who were wheelchair bound were unable to cooperate satisfactorily for glaucoma screening. As a result, different technicians and methods were utilized in screening their uncooperative cases. Therefore, it can be deduced that screening with a standard technique by a single examiner is essential in screening glaucoma in the geriatrics in our study because only 3.5% of the cases were wheelchair-dependent.

Background diabetic retinopathy was found in only 1 case (2.5% of cases), however, it did not cause any significant visual loss. None of the cases in our study was found to have age related macular degeneration.

The prevalence of the preventable and treatable cause of visual impairment and blindness such as cataract can be reduced if patients such as in our study are given adequate and continuous eye assessments. Policies for the ophthalmological assessment and referral of patients need to be implemented more uniformly. It can be inferred that interventions that can slow or prevent the decline in visual acuity by 10 or more years can have a substantial impact, possibly improving quality of life and decreasing the costs of surgical and medical intervention associated with conditions leading to visual loss.

Geriatric eye disease already consumes a significant portion of ophthalmic care but with more and more

people surviving into very old age, a significant portion of that care will be administered to patients in nursing homes. Routine screening for eye disorders, treating reversible conditions whenever possible, and instituting low vision training are the possible measures that can be taken to relieve the burden placed on nursing home staff.

There are several implications that can be deduced from our study. Firstly, the magnitude of visual impairment and blindness in this nursing home was high but is preventable and avoidable. Secondly, there is a need to involve ophthalmic and optometric services as part of the comprehensive medical care in nursing homes and voluntary services to cope with increasing demands should be encouraged.

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