

Elderly people need an eye examination before entering nursing homes

Hanne Jensen¹ & Gitte Tubæk²

ABSTRACT

INTRODUCTION: It is well documented that eye diseases develop with ageing and thus more elderly people have a visual handicap. It is important that the elderly are examined well, that they have the correct prescription and optimal aids. This is especially applicable to those residing in nursing homes.

METHOD: In this study, an eye examination was offered to all residents in 11 nursing homes. The examination was conducted by an optometrist who brought her own equipment. A medical history was recorded, an eye examination conducted, and the ophthalmologist assessed the records and evaluated the optical coherence tomography images. Personnel were given a questionnaire concerning their assessment of the residents' visual abilities.

RESULTS: Among 502 potential residents, 371 were examined, whereas 131 could not participate. A total of 22% were visually impaired, 13% socially blind and 13% were unable to cooperate. A total of 32% were well-described having correct optics, 15% were recommended glasses and 36% were referred to an ophthalmologist for further diagnostics or check-up. The most frequent cause of impaired vision was cataract and age-related macular degeneration. For many of the residents, no diagnosis was registered, and the staff had no knowledge of the cause of their resident's vision impairment. Furthermore, in one of every four cases, staff were unaware that the resident's vision was impaired.

CONCLUSION: It is recommended that everyone who is referred to a retirement home receives an eye examination and that nursing home staff are given relevant knowledge that will allow them to assist the residents in a proper way due to vision-related issues.

FUNDING: The study was funded by the Danish Association for the Blind and by Dag Lenards Fond.

TRIAL REGISTRATION: not relevant.

It is well documented that elderly persons have a higher prevalence of both primary eye diseases and systemic diseases with eye complications than younger people do, and there are age-related changes in the visual function [1-3]. Refractive errors, age-related macular degeneration (AMD), cataract as well as glaucoma are associated with increasing age. With age comes also impaired hearing, and dual sensory impairment has major consequences [4-7]. Lack of information about loss of func-

tion and thus lack of aids reduces the capability and increases the risk of not being able to carry out ordinary, everyday tasks, which may, in turn, lead to a negative spiral of isolation and depression that affects the functional capacity and leads to a reduced quality of life [8].

A study of 2,888 visually impaired patients with an average age of 79 years showed that 36% could have improved their vision by using glasses [9]. Those living in nursing homes depend on people who can take care of their needs; that means taking care of glasses, optic aids, lighting and materials. In the case of any eye diseases carers must furthermore ensure that their residents are seen by an optician or ophthalmologist since residents are often unable to do so themselves.

That is the background for this study of eye status in nursing home residents in Denmark; a study that was conducted in collaboration with the Danish Association for the Blind (DBS).

METHODS

Via the DBS, nursing homes in all five Danish regions were contacted by phone, and information regarding the objective and scope of the project was provided. Specifically, the nursing homes were informed that the study included taking of a medical history and an eye exam in the nursing home with portable equipment, and that relatives and residents wishing to participate were needed. Furthermore, the nursing homes were informed that the permanent staff would be able to assist during the sessions.

All residents were then contacted by the optometrist, and information was collected regarding diagnoses and medicine lists and a history was taken. A questionnaire for each resident was submitted to the staff with questions regarding their assessment of the patient's visual function.

The eye examination included visual acuity near and at a distance evaluated with logMar charts, contrast sensitivity for near vision, refraction measured using Retinomax, slit lamp examination, intraocular pressure measured with Icare and an optical coherence tomography (OCT) examination of fundus.

Subsequently, a report on each individual resident was printed including a description of the patient's eye status. The reports, which were passed on to the nursing

ORIGINAL ARTICLE

- 1) The Eye Clinic, Kennedy Center, Rigshospitalet – Glostrup
- 2) GenSyn Optik, Vejle, Denmark

Dan Med J
2017;64(2):A5325

home, comprised a recommendation of eyeglass and aids, and a referral to an ophthalmologist in case of inconclusive visual impairment, suspicion of cataract or untreated retinal changes.

The ophthalmologist advised the optometrist, assessed the results and evaluated the OCT examinations.

From a total of 570 residents, only 502 were able to speak with the optometrist; the remaining were hospitalised, had departed or were so ill that they could not be contacted. Among the 502 remaining residents, some either would not or could not participate, and therefore 371 eye examinations were conducted. Thus, 131 individuals were not examined and we have no knowledge of their eye status. There was no statistically significant difference in age between the two groups, even though there were more elderly > 80 years of age in the group that was not examined.

Distribution by age and gender is shown in **Figure 1** (232 women and 139 men).

Trial registration: not relevant.

FIGURE 1

Gender and age distribution of the 371 examined nursing home residents.

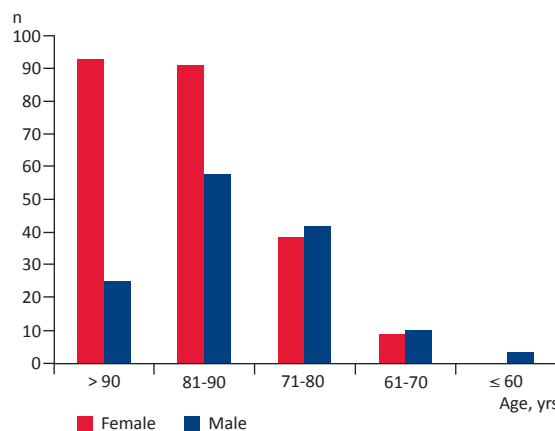
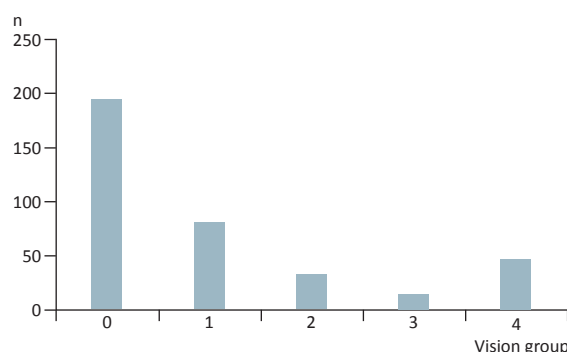


FIGURE 2

Number of inhabitants, by vision groups.



RESULTS

During the examinations of the 371 residents, not all tests could be concluded as many residents were unable to complete the entire programme.

Visual acuity

The visual acuity (VA) of the best eye with the best correction is shown in **Figure 2**. Of the residents who were examined, 52% had a VA of more than 6/18 (Vision Group 0) (one third had VA 6/12, two thirds better), 22% had a VA between 6/18 and 6/60 or constriction of the visual field (Vision Group 1) and were thus visually impaired, 13% had a VA ≤ 6/60 (Vision Groups 2 and 3) and were therefore classified as blind. In 13% of the residents, it was not possible to determine the visual acuity. There was a trend towards more visually impaired elderly in nursing homes located in bigger cities than in smaller communities, but the trend was not statistically significant.

Near vision was measured, and 228 were found to have a near VA > 0.32 with optimal optic and thus a value that allows for reading. Near VA was not measured in 104 residents, while 39 (15%) were found to have such poor vision that reading was not possible/was difficult without further low-vision aids.

In 24 out of the 39 cases, low vision optics were offered. The staff was advised regarding the use of the aids that were already present.

In a group of residents, an examination was carried out to determine their contrast sensitivity. In 36 out of 51 participants, the VA was reduced < 0.32 with low contrast.

This group has problems reading unless there is optimal lighting and good contrast of the reading material. This was pointed out to the staff, and the situation presumably characterises a large number of the residents.

Refraction

Figure 3 shows the distribution of the refraction (Retinomax value as spherical equivalent). Half of the residents had a refractive error between -2 and +1 – or values at which they may do well without glasses. This means that the other half should use correctly prescribed glasses to be able to participate in social activities. All residents, including those who had undergone cataract surgery, were included.

Intraocular pressure

Intraocular pressure was measured with Icare and the distribution for the right eye is shown in **Figure 4**.

In the seven cases in which a pressure exceeding 20 mmHg was measured, the person had already been seen by or referred to an ophthalmologist.

Eye diagnoses

Cataract

The number of persons operated for cataract increased with age: 51 (43%) of those over 90 years had been operated, whereas 50 (33%) of those between 90 and 80 years and 14 (14%) of those younger than 80 years had received surgery. In 127 cases, slit lamp examinations showed lens opacities and 78 of these were referred to an ophthalmologist for assessment of suitability for surgery.

Glaucoma

The frequency of residents with glaucoma increased with age so that there were ten (9%) with glaucoma among residents over 90 years, nine (6%) between 90 and 80 years, and three (3%) in the group under 80 years.

OCT diagnoses: A total of 117 individuals were examined. This was the hardest examination to conduct since it required that the resident was capable of remaining still with their head on a chin support. Some of the images from the 117 participants had to be discarded due to poor quality. Upon reviewing the images, 58 participants were found to have AMD, 23 drusen, seven changes in the papilla and 29 were normal.

General diagnoses

Based on a copy of the medication journal, the residents' general diagnoses requiring treatment could be established. Of those examined, 78 were being treated for dementia, 78 for mental disorders or depression, 35 for diabetes, 36 had consequences following earlier stroke, while the remainder were distributed on a number of other diagnoses (Parkinson, rheumatic diseases, etc.) There was a non-significantly greater number of residents with dementia in the group that was not examined. It was not possible to describe the residents' cognitive level.

The staff's evaluation of their residents' visual function

In 154 cases, the staff felt that the resident had vision problems, but 95 of these belonged to vision group 0, which is characterised by a visual function that should not cause major problems.

In 159 cases, the staff did not think that the resident had vision problems – 119 of these residents belonged to vision group 0, which is consistent with the staff's view, but in 40 cases the resident was, in fact, visually impaired or blind. This corresponds to one in every four of the 159 residents in whom staff was unaware of any vision handicap.

There were no significant differences between the staff's evaluation in the different nursing homes.

There were a number of residents for whom the

FIGURE 3

Distribution of refraction in inhabitants in nursing homes.

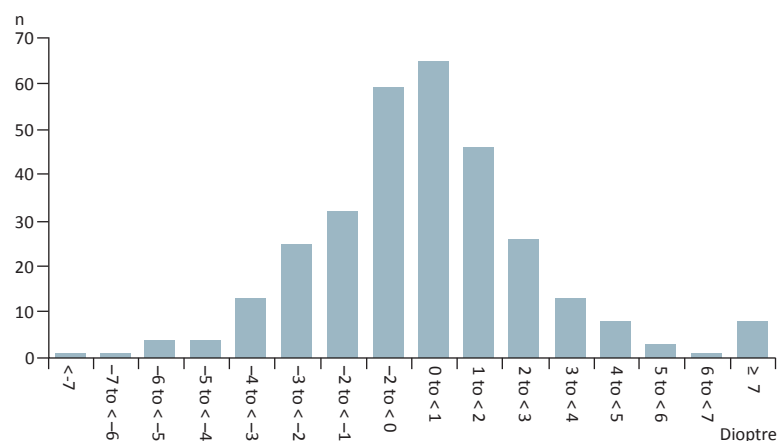
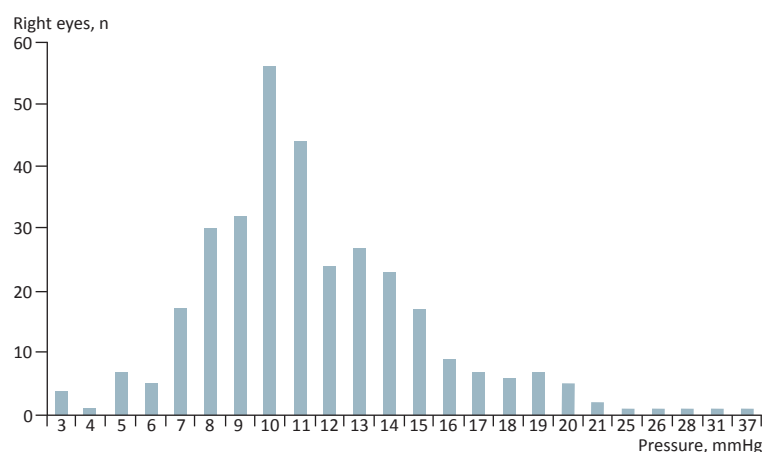


FIGURE 4

Intraocular pressure in nursing home inhabitants.

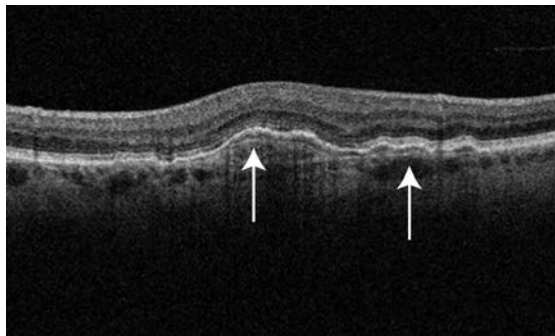


staff did not fill out the form, but the fact remains that there is only partial consistency between the values that can be measured and the staff's perception of their residents' visual ability.

DISCUSSION

It is difficult to examine residents in nursing homes. In Baltimore [10], 499 of 738 residents were examined and 17% were confirmed blind and 19% visually impaired. Cataract was the most common cause (35%), the second was AMD (20%) and the third glaucoma (5%). It was concluded that a large group had cognitive problems overshadowing the possibility of intervention. The authors

Optical coherence tomography of the retina from an 87-year-old man. The pigment epithelium elevates corresponding to drusen of various size (arrows). There is also disruption in the photoreceptor line.



stated that not everyone can be helped, even though it is technically possible, but it was also noted that informing the caregivers is essential. A study from Würzburg [11] describes a similar investigation of residents in nursing homes: Of 391 residents, 203 were capable of participating in the study, whereas the remaining could not participate. A total of 88 patients were found to have cataract, 52 AMD and 33 glaucoma. Their visual acuity was reduced, but a new correction and optimisation of the light could partially reduce the problems for 120 individuals.

We found that 118 (32%) of the residents had a well-described eye status – 84 of those examined had good vision and correct glasses, 34 had a known diagnosis and treatments were initiated and the staff had been informed, 135 (36%) were referred to an ophthalmologist for further diagnostics or follow-up examination, 128 had cataract that had not been operated, and 58 out of 117 examined had AMD. As expected, the number of glaucoma patients increased with age [12]. Many of the residents had no registered diagnosis, and the staff had no knowledge of the cause of their visual impairment. In 15%, glasses (new prescription or use of existing glasses) were recommended, and in all cases recommendations were given with regard to lighting, material, etc. Thus, the staff gained current knowledge about their residents.

One study [13] describes a programme headed by an optometrist at a nursing home in Ontario. The objective was to conduct and evaluate the vision function and diagnoses as well as to educate the students and staff at the nursing homes. Over a period of two months, 91 individuals (average age of 87 years) were examined by an optometrist and 2-4 students, and in some cases also by an ophthalmologist. Cataract was found in 54, AMD in 38 and glaucoma in 25. In all, 31 of the 91 residents were demented and a total of 56 of the patients had general problems that made the examinations more difficult. It is unclear how many patients had to be seen several times.

Thus, there is consistency between the present

study and the literature with respect to the known causes of visual impairment (AMD, cataract and glaucoma), and that the visual function can be optimised depending on the magnitude of cognitive problems. It is documented that it is useful to rehabilitate patients with impaired vision [14], but it must be done while the patients can participate. In our study, where an experienced optician brought in equipment making the eye examination possible, there were still many who could not be examined, and it is obvious that it would be better to have an eye examination before the resident enters the nursing home in order also to provide the staff with the correct knowledge from the onset.

This conclusion was exactly the same as the one arrived at in 1980, when a pilot study was conducted at nursing homes on Funen [15].

CONCLUSION

Information on eye diagnoses is lacking in the residents' medical records, and the staff lack knowledge about the significance of eye diseases. A recent eye status in any person referred to a nursing home will improve the likelihood of assessing the resident when he/she moves into the nursing home, and allow the staff to learn about the premises of each resident (eye glasses needed, expected level of functioning, need for lightening or optical aids). In case of a subsequent loss of functioning, staff may refer the resident to an ophthalmologist for assessment, or, in cases of recognised, potential diagnosis of blindness (AMD), may support and guide their residents based on current knowledge.

It can be concluded that the recommendations [15] have not been followed, and since the citizens who are currently in nursing homes are presumably more dependent on care and have a greater need for support and help than previously, we hereby draw attention to the recommendation.

CORRESPONDENCE: Hanne Jensen. E-mail: h.jensen@dadlnet.dk

ACCEPTED: 29 November 2016

CONFLICTS OF INTEREST: Disclosure forms provided by the authors are available with the full text of this article at www.danmedj.dk

LITERATURE

1. Klein R, Klein BE. The prevalence of age-related eye disease and visual impairment in ageing: current estimates. *Invest Ophthalmol Vis Sci* 2013;54:ORFSF5-13.
2. Rubin GS, West SK, Munõz B. A comprehensive assessment of visual impairment in a population of older Americans. *Invest Ophthalmol Vis Sci* 1997;38:557-68.
3. Attebo K, Mitchell P, Smith W. Visual acuity and the causes of visual loss in Australia: the Blue Mountains Eye study. *Ophthalmol* 1996;103:357-64.
4. Heine C, Browning CJ. Communication and psychosocial consequences of sensory loss in older adults: overview and rehabilitation directions. *Disabil Rehab* 2002;24:763-73.
5. Crews JE, Campbell VA. Vision impairment and hearing loss among community-dwelling older Americans. *Am J Pub Health* 2004;94:823-9.
6. Hong T, Mitchell P, Burlutsky G et al. Visual impairment and the incidence of falls and fractures among older people: longitudinal findings from the Blue Mountains Eye study. *Invest Ophthalmol Vis Sci* 2014;55:7589-93.
7. Gopinath B, McMahon CM, Burlutsky G et al. Hearing and vision impairment and the 5-year incidence of falls in older adults. *Age Ageing* 2016;45:409-14.

8. Vu H, Keeffe JE, McCarty CA et al. Impact of unilateral and bilateral vision loss on quality of life Br J Ophthalmol 2005;89:360-3.
9. Holton H. Den vigtige refraction i socialoftalmologien. Optikerens 2009; 6:10-12.
10. Tielsch JM, Javitt JC, Coleman A et al. The prevalence of blindness and visual impairment among nursing home residents in Baltimore. N Eng J Med 1995;332:1205-9.
11. Thederan L, Steinmetz S, Kampmann S et al. The prevalence of visual impairment in retirement home residents. Dtsch Arztebl Int 2016;113: 323-7.
12. Gupta P, Zhao D, Guallar E et al. Prevalence of glaucoma in the United States: the 2005-2008 national health and nutrition examination survey. Invest Ophthalmol Vis Sci 2016;57:2905-13.
13. Labreche T, Stolee P, McLeod J. An optometrist-led care program for older residents of retirement homes and long-term care facilities. Can Geriatr J 2011;14:8-11.
14. Goldstein JE, Jackson ML, Fox SM et al. Clinical meaningful rehabilitation outcomes of low vision patients served by outpatient clinical centers. JAMA 2015;133:762-9.
15. Krarup JC, Goldschmidt E. Synshandicap hos ældre på plejehjem. Ugeskr Læger 1980;142:1897-9.