Prevalence of Ocular Conditions Causing Low Vision & the Low Vision Aids Dispensed at a Tertiary Eye Care Centre in Sangli, India

Swechchha Sharma[1], Sulagodu Prakash Bhavna[2], Neha Kumari Sah[3]

[1]BSc Optometry, Mero Eye Foundation, Khatmandu, Nepal, [2]M.Optom, FASCO, Sankara Eye Hospital, Near Kundanahalli Signal, Varthur Main Road, Bangalore, India, [3]BSc Optometry, Clear Vision Eye Clinic, Khatmandu, Nepal

Abstract

Introduction: The prevalence of visual impairment and blindness is not alien to India. The current study is done in order to understand the causes and management options of low vision and blindness among various age groups in a tertiary eye care centre in Sangli, India.

Methods: In our retrospective study, data of the subjects were obtained from Nandadeep Eye Hospital, Sangli, India. Information of 102 patients who had attended the Low vision evaluation from 1st January 2016 to 30th November 2017 was collected after seeking consent from hospital authorities. Demographic and clinical data were assessed and analysed (descriptive analysis) using SPSS software version 23.

Results: A total of 124 patients were referred to the low vision clinic of Nandadeep eye hospital, Sangli, from 2016 – 2017. Among them, 22 patients were excluded from the study. There were 65(63.7%) Males with a mean age of 47.7 years. Among 102 low vision patients. Prevalence of Diabetic retinopathy (16.6%) was found to be higher among different diseases causing low vision, and the most commonly dispensed aid was spectacle magnifier with BI prism (70, 57%).

Conclusion: - In India, the prevalence of diabetic retinopathy (16.6%) was higher among different diseases causing low vision. Among various low vision aids, spectacle magnifiers with BI prism, 57% were most commonly dispensed.

Keywords: *Low vision, Low vision Aids, Ocular diseases, Prevalence, Spectacle magnifiers.*

Introduction

The World Health Organization (WHO 1922) describes a person with low vision as "one who has impairment of visual function, even after treatment and/or standard refractive correction, and has a visual acuity less than 6/18 [the metric equivalent of 20/200] to light perception or a visual field of less than ten degrees from the point of fixation, but who uses or is potentially able to use, vision for the planning and/or execution of task".[1]

Globally, uncorrected refractive errors are the leading cause of moderate and severe visual impairment; cataracts remain the leading cause of blindness in middle and low-income countries.[1] At the outset, numerous ocular diseases cause low vision. The few most common causes of low vision include macular degeneration, diabetic retinopathy, retinitis pigmentosa, amblyopia, retinopathy of prematurity, retinal detachment, and glaucoma.[2] In developed nations, low vision is seen predominantly among the age group of above 75 years.[3,4]

Furthermore, vision loss does not directly need to affect the peoples' ability to do a task but changes the way the person does or executes it. The life activities of the person do not change with the loss of vision. New approaches and methods of adaptation to the task need to be looked at. The persons with visual impairment face difficulty in reading and writing, orientation and mobility, driving, grooming, recognizing faces, ascending and

descending stairs, identifying currency notes, food, etc. Few studies have shown that the prevalence of low vision is up to 60% among the elderly population.[5–9]

There are numerous devices, techniques, and resources for the persons with visual impairment to remain independent, including devices that use relative size magnification, contrast, and colour enhancement techniques, using audio, reorganizing the visual environment, and many more. The devices may be electronic, optical, and non-optical.

Moreover, low vision is a significant public health problem & provision of low vision services is one of the priorities in the global initiative, Vision 2020- The right to Sight. Albeit the prevalence of visual impairment and low vision is increasing, the uptake continues to be relatively small in developing countries like India [2]. The current study is done to understand the causes and management options for low vision patients.

There are few studies done on the same lines. According to literature, age-related macular degeneration was one of the leading causes of low vision among the elderly population[10–15]. The second leading cause was retinitis pigmentosa[12,16,17] and diabetic retinopathy[10,18]. Some of the other causes were optic atrophy[19], cataract[12], glaucoma[20], etc. Among the pediatric population, the leading causes for low vision, according to literature, were nystagmus[14,17], congenital cataract[14], amblyopia[16], degenerative myopia[17] and retinitis pigmentosa.

The management given to the patient with low vision can be optical, non-optical, or both with environmental modifications. In many studies, there are various types of devices advised for the management of low vision patients. According to literature, spectacle magnifiers were dispensed maximally to the patients with difficulties[10,16,21,22], followed by telescopes[16,17,23], other types of magnifiers[10,23], and video magnifiers[17].

Method

In our study, we aimed to estimate the prevalence of different diseases causing low vision & the low vision aids dispensed at a tertiary eye care center. The study was approved by the institution board, Naseema Institute of Optometry and Research, Bangalore, India. The study was following the tenets of the declaration of Helsinki. The clinical records of the patients were taken, and a retrospective study was conducted from December 2017 to 2018 at the Low vision department of Nandadeep Eye Hospital at Sangli, India. Records of patients having vision less than 6/18 in the better eye, and to whom the low vision aids were dispensed were included in the study. Incomplete records were excluded.

Data of 124 patients who visited Nandadeep eye hospital, low vision clinic from 1st January 2016 – 30th November 2017 were obtained. Among the 124, 22 were excluded from the study based on exclusion criteria. A total of 102 individuals with low vision were considered for the study. Patients underwent a comprehensive clinical low vision examination. Details were taken, which included demographic information like age {which was further divided into four categories[24] 1. Children (<18 Yrs), 2. Young adults (18-35 Yrs), 3. Middle-aged adults (36-55 Yrs), 4. Older adults (>55 Yrs)}, and gender. Clinical information included ocular diagnosis, the low vision aid prescribed to the patient, and high contrast visual acuity pre and post low vision aids trial. The descriptive data analysis was done using SPSS V16.

Results

A total of 102 individuals with low vision were considered for the study, which included a majority of males n=65 (63.7%). The mean age was 47.7 years, with a standard deviation of ±40. Majority n=44, (43.1%) were aged above 55 years (Older adults), n=25 (24.5%) were middle-aged adults (36-55 years), 15(14.7%) were young adults (18-35 years) and n=18 (17.6%) were children (<18yrs) in our study.

Among 102 participants, the most common condition causing low vision was diabetic retinopathy (DR) (16.6%), followed by age-related macular degeneration (ARMD) (14.7%), and retinitis pigmentosa (RP) (14.7%) equally, and lastly, glaucoma (11.7%). Similarly, a minority of participants were having conditions like chorioretinal atrophy, heredomacular degeneration, serpiginous choroiditis, choroidal coloboma (<1%), etc. as shown in Figure 1.

Among the participants, most commonly dispensed aid was spectacle magnifiers with BI prism n=70, (57%), other handheld magnifiers n=29, (23.5%), followed by

handheld monocular telescopes n=21, (17%), and very few numbers of handheld video magnifiers n=3, (2.5%).

Among the 18 children (<18years), RP (50%), optic atrophy (16%) were the most common cause. RP (26.6%), albinism (20%) were the most common cause in younger adults (18-35yrs). In contrast, diabetic retinopathy (28%), glaucoma (24%) were the most prevalent causes in middle-aged adult (36-55 years) patients. ARMD (29.5%) and diabetic retinopathy (22.7%) were the commonest in older adults (>55yrs). Table 2 shows the graphical representation of various ocular conditions presented in different age groups.

Among the age groups, handheld monocular telescopes (44%), and magnifiers (stand, dome, pocket, cutaway, handheld) (34.4%) were most commonly dispensed to children, spectacle magnifier with BI prism (42%) was widely dispensed followed by magnifiers (26%) and handheld telescopes (26%) among young adults. Similarly, spectacle magnifier with BI prism (70%) and magnifiers (16.6%) were most commonly dispensed to middle-aged adults, and spectacle magnifiers with BI prism (80%) were most frequently dispensed to older adults followed by magnifiers (20%). The video magnifiers, however, (<5%) were the least commonly dispensed device among all age groups. Table 3 shows the graphical representation of the distribution of low vision aids dispensed among age groups.

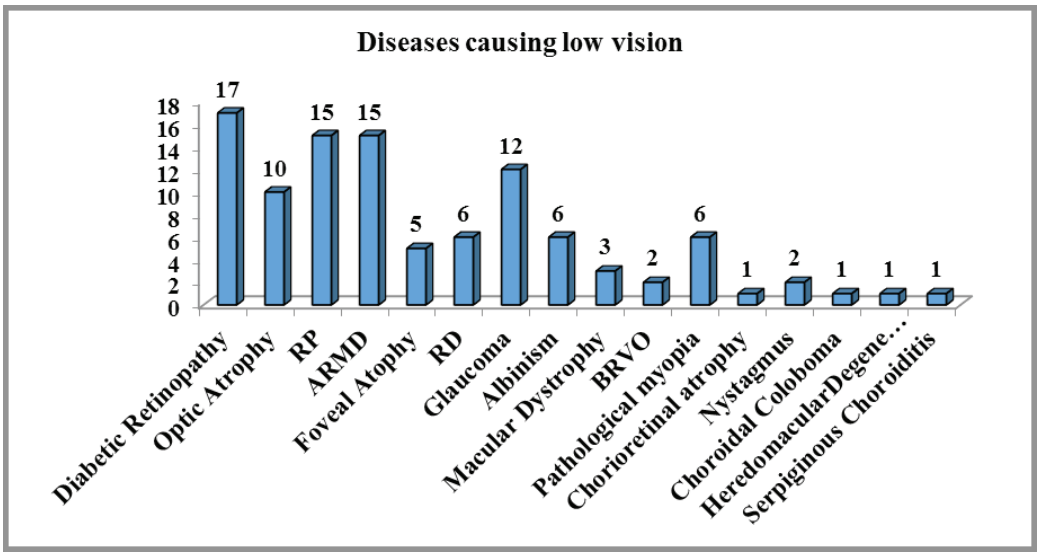

Figure 1: Graph representing ocular diseases causing low vision among patients.

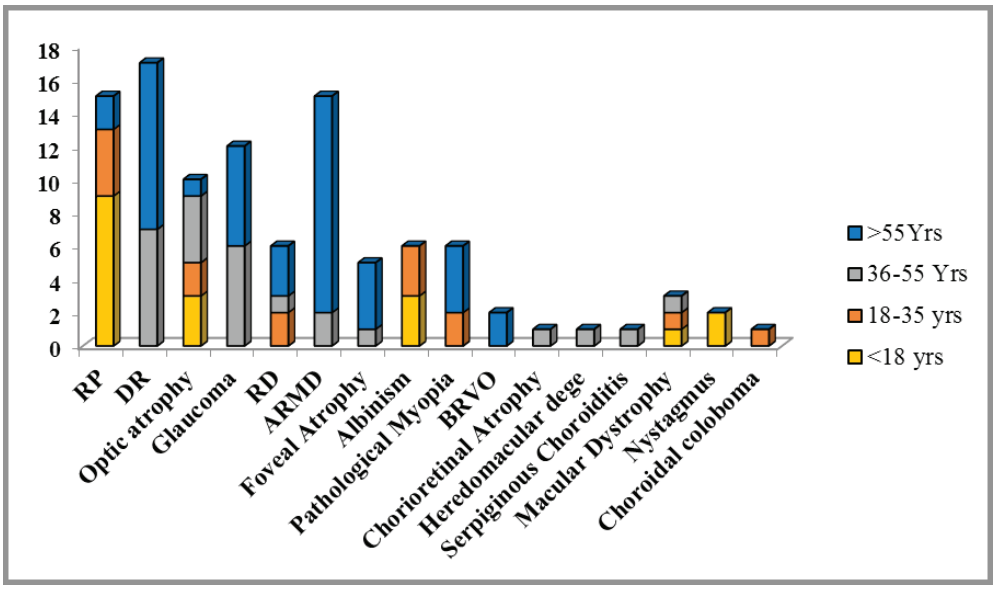

Figure 2: Graph presenting the various ocular conditions presented among different age groups.

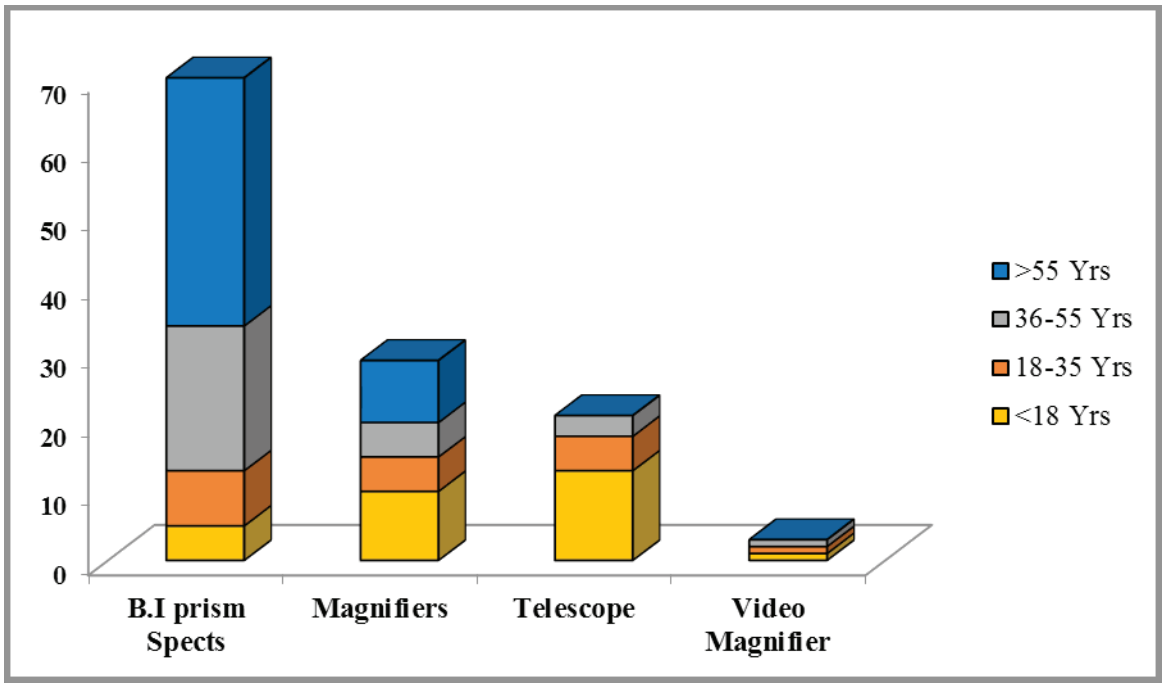

Figure 3: Graph representing the distribution of low vision aids dispensed among different age groups.

Discussion

Low vision has been reported to increase with age, both in and around the country[10,25–27], and also around the world[13,28,29]. In our study population, 43.1% were older adults (>55 years). Likewise, according to a study done by Mohidin N et al., the majority of patients were from the younger age groups (73.8 percent) less than 50 years of age[11]. Similarly, Olusanya B suggested that the majority (58%) were aged below 50 years[13], shows that a yonger population is the majority.

From the result of our study, the prevalence of Diabetic retinopathy, ARMD, and RP is higher. According to Sathyan S et al[15], diabetic retinopathy (18.1%) was 2nd common cause, likewise, according to Khan SA et al[17], diabetic retinopathy(13%) was 3rd common cause for low vision. In contrast, according to Olusanya et al[13], only 1% had diabetic retinopathy; this may be due to the majority (58%) of their subjects were aged below 50 years.

Similarly, studies[13,16,17] has found Retinitis pigmentosa to be the most common cause for low vision which is almost closer to the result of the current study where RP is the another most common cause after DR. The prevalence of ARMD, in this study, is found to be similar in studies done by Kim JH et al[19] and Olusanya et al[13]. In this research, we found that ARMD was the 2nd most common disease leading to low vision. The prevalence of glaucoma (11.7%) is found to be higher, in resonance with a study done by Vijaya L et al[20], wherein glaucoma was the leading cause of irreversible blindness. However, contradicting this statement, in a few studies, the prevalence of glaucoma was found to be very low[10,16]. Although the prevalence of diseases leading to low vision may vary from one study to another, the first five significant causes leading to low vision are almost similar in all studies, and posterior segment diseases are the leading causes for low vision.

Similar to the results of the current study, Kim et al. concluded that low vision aids for near are dispensed more than the ones for distance[19]. In many studies[10,16], including the current study, it was seen that the spectacle magnifiers were dispensed frequently when compared to the other magnifiers. However, according to Khanal et al[16], telescopes were the most commonly prescribed devices; this might be due to a higher number of the younger population in the study.

In resonance with the current study, a few other studies[12,14] have shown that RP, optic atrophy, and albinism are significant causes of low vision among the younger population.

From the maximum of the studies, it was found that spectacle magnifiers were most commonly prescribed, and electronic aids like CCTV were rarely prescribed. In the research done by Khan SA et al[17], CCTV was prescribed to three patients only among the 450 low vision patients. Similarly, in our study also only three video magnifiers are prescribed among the population of 102 low vision patients. This may be due to the expense of the device. Aids like CCTV should be made cheaper so that the more patients can have access to them and be benefitted.

Conclusion

Among the various conditions causing low vision, the prevalence of diabetic retinopathy was seen to be higher with 16.6%, followed by ARMD and RP where the two diseases were found to have an equal prevalence of 14.7%. Among various types of low vision aids dispensed to patients, spectacle magnifiers with BI prism incorporated were most frequently dispensed. It was found that the prevalence of RP was higher among children (<18yrs) and younger adults (18-35yrs) with a prevalence of 50% and 26.6%, respectively. Diabetic retinopathy (28%) was most prevalent among middle-aged adult (36-55yrs) patients, while ARMD (29.5%) had higher prevalence among older adults (>55yrs). Handheld monocular telescopes (44%) were most commonly dispensed to children, spectacle magnifiers with BI prism were often dispensed among young adults (42%), middle-aged adults (70%), and older adults (80%).

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: As the current study is a retrospective one, hospital authority permission has been taken and the current study follows the declaration of tenets of Helsinki.

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