

## Original article

# Characteristic of low vision patients attending an eye hospital in eastern region of Nepal

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### Abstract

**Introduction:** Low vision is an important public health problem. **Objective:** To study the profile of low vision patients in a hospital of Nepal. **Materials and methods:** Information related to the patients' profile, visual status, ocular disease and, low vision devices prescribed were obtained retrospectively from the records of 1,860 visually-impaired patients, regardless of the cause, presenting to the low vision department of the Biratnagar Eye Hospital, Biratnagar, Nepal, over a period of four years. These patients, after a comprehensive ocular examination, underwent low vision examination by an ophthalmologist and a low vision specialist. **Results:** Of 1,860 patients, males comprised 1298 (70 %), while 562 (30 %) patients were female. Six hundred and one (32.3%) patients were of less than 20 years while 398(21.4%) were more than 60 years of age. Agriculture (500, 27 %), household work (341, 18 %) and students (308, 17 %) were the common occupations. Retinal diseases were the commonest cause of low vision. They were: macular disorders 408 (22 %), retinitis pigmentosa 226 (12.1 %) and other retinal causes 361 (19.4 %) (diabetic retinopathy, choroidal coloboma, post laser for retinal vasculitis and central retinal/branch retinal vein occlusion, healed macular chorioretinal scar secondary to retinochroiditis and choroiditis). Refractive error 215 (11.5 %), amblyopia 49 (2.6 %), optic atrophy 144 (7.8 %) and microphthalmos 105 (5.6 %) were the other causes. Uncorrected distance visual acuity was between 6/24 and 6/60 in 509 (27.4 %) and between 5/60 and PL in 1,327 (71.3 %) patients. Similarly, near visual acuity with vision better than 2.50 M (N 20) and worse than 2.50M (N20) was present in 643(34.5%) and 1,217(65.5%) patients. About 67% and 54.5% of the patients had some improvement in their distance and near visual acuity with glasses and low vision aids. Distance spectacles 909 (49 %), near spectacles 106 (5.7 %), hand held magnifiers 78 (4 %) and telescopes 18 (1 %) were the optical devices prescribed. **Conclusion:** The prevalence of low vision is common among the people of the younger and older age groups. Retinal diseases are common among the causes for low vision. Adequate prescription and availability of low vision devices can improve the visual acuity.

**Keywords:** blindness, low vision, optical devices, visual impairment

Received on: 19/02/14

Accepted on: 12/10/14

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## Introduction

Visual impairment (or vision impairment) is vision loss of a person to such a degree as to qualify him for an additional support need through a significant limitation of visual capability resulting from either disease, trauma, or congenital or degenerative conditions that cannot be corrected by conventional means, such as refractive correction or medication (Arditi et al, 1998). However, low vision is defined as;

“A person with low vision is one who has impairment of visual function even after treatment and/ or refractive correction, and has a visual acuity in the better eye < 6/18 to light perception (LP), or a visual field of <10° from the point of fixation, but who uses or is potentially able to use vision for the planning or execution of the task” (WHO 1992, 1993).

According to the World Health Organization (WHO), over 285 million people in the world are visually impaired, out of which, 39 million are blind and 246 million have moderate to severe visual impairment (WHO, 2010). It is predicted that without extra interventions, these numbers will rise to 75 million blind and 200 million visually-impaired by the year 2020 (WHO, 2011). It is also estimated that about 80 % causes of blindness around the world are avoidable and 90 % of these blind people live in developing countries (WHO, 2010). Though the prevalence of blindness in Nepal reduced from 0.84 % in 1981 (LB Brilliant et al, 1985) to 0.35 % (estimated) in 2011 (NNJS, 2012), the availability of low vision services in the country is still in the budding stage. According to the Nepal Netra Jyoti Sangh (NNJS), the estimated prevalence of low vision in Nepal in the above 50 age group is 1.3 %. However, there is a lack of data indicating the prevalence of low vision in the younger Nepalese people (NNJS, 2012). Hence, this study was carried out with an objective of identifying the magnitude of low vision, its causes and characteristics in a

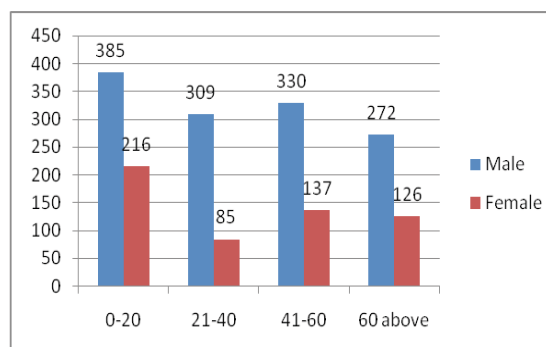
hospital of the eastern region of Nepal.

## Materials and methods

This study was done at Biratnagar Eye Hospital, Biratnagar, Nepal, which is a tertiary referral eye hospital offering various facilities. All the information was obtained retrospectively from the records of 1,860 visually impaired patients who had attended the low vision clinic from 1<sup>st</sup> January 2009 to 31<sup>st</sup> December 2012. These patients were from eastern Nepal and the neighboring parts of India. All of these visually impaired patients, regardless of the cause, potential for treatment and the ability to use residual vision, underwent a detailed clinical examination by an ophthalmologist and a low vision specialist. The parameters studied were age, gender, visual acuity, profession, ocular conditions causing the low vision, and types of low-vision devices and methods prescribed.

## Results

The profile of a total of 1,860 low vision patients was reviewed retrospectively. Males comprised 1,298 (70 %) of total patients and 562 (30 %) patients were female. The male to female ratio was 2.30: 1. The minimum age of presentation was three years while the maximum was 83 years. Nearly one-third of the patients were in the less than 20 years age group 601 (32.3 %). Only 398 (21.4%) patients were in the 60 years and above group (Figure 1).



**Figure 1:** Sex distribution with age

Table 1 shows the professional categories of the patients.

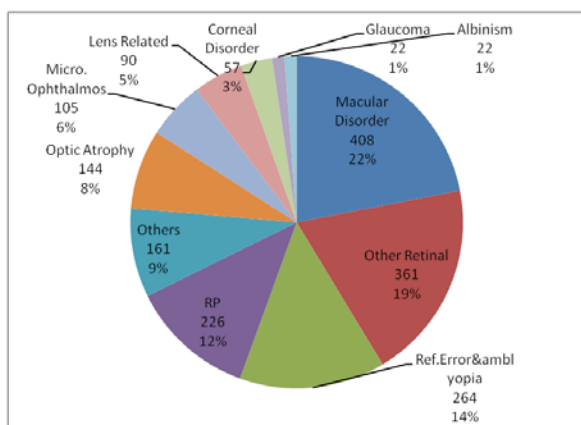


**Table 1:** Category of different patients at the low vision clinic

<b>Agriculture</b>	<b>500(27%)</b>
Home maker	341(18%)
Student	308(17%)
Others	244(13%)
Child	136(8%)
Skilled work	99(5%)
Business	80(4%)
Unemployed	79(4%)
Unskilled work	36(2%)
Retired due to Low Vision	35(2%)

There were numerous causes for the low vision. Retinal causes were more common than the other causes. Among the retinal causes, macular disorders (macular dystrophy, macular hole, ARMD) were found in 408 (22 %). There were 226 (12.1 %) cases of retinitis pigmentosa. Other retinal causes (diabetic retinopathy, choroidal coloboma, post retinal laser for retinal vasculitis, central retinal/branch retinal vein occlusion, healed macular chorioretinal scar secondary to choroiditis and retinochoroiditis) were found in 361 (19.4 %).

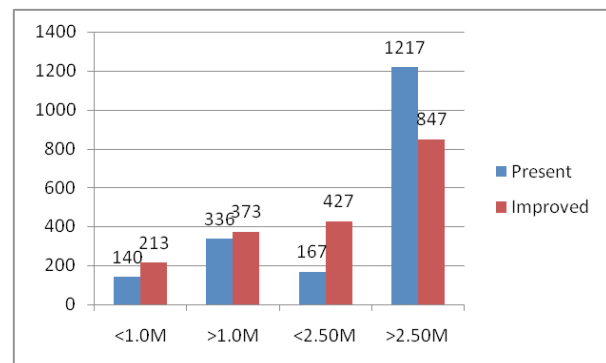
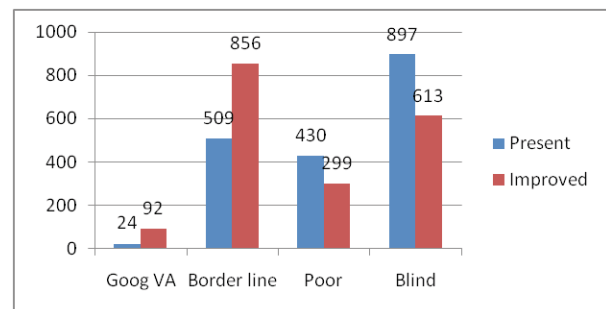
Similarly, refractive error was found in 215 (11.5 %), amblyopia in 49 (2.6 %), optic atrophy in 144 (7.8 %) and microphthalmos in 105 (5.6 %) patients (Figure 2).



**Figure 2:** Pie chart showing low vision diagnosis

Among these low vision patients, 509 (27.4 %) subjects had borderline (6/24 and 6/60) distance visual acuity, 430 (23.1 %) had poor (5/60 - 3/60) distance visual acuity and 897 (48.2 %)

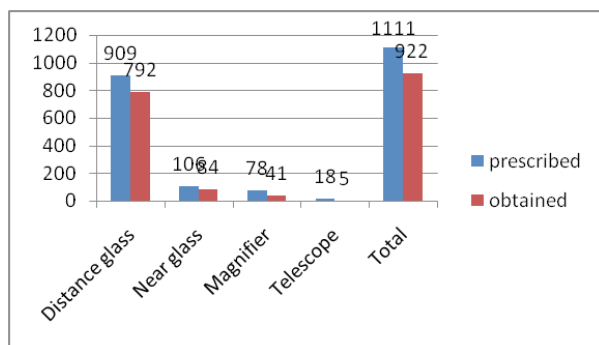
were blind (less than 3/60) at presentation. Near visual acuity with vision better than of 2.50 M (N 20) was present in 643 (34.5 %) patients and 1,217 (65.5 %) patients had vision poor than 2.50 M (N 20). About 67% of the patients showed some improvement in their distance visual acuity (Figure 3). Similarly, 54.5 % of the patients showed some improvement in their near visual acuity (Figure 4).



**Figure 3 and 4:** Distance and near visual acuity before and after prescription of low vision aids

Various low vision devices (LVD) were prescribed. These were: distance spectacles 909 (49 %), near spectacles 106 (5.7 %), hand held magnifiers 78 (4 %) and telescopes 18 (1 %). Distance spectacles were prescribed for macular disorders, retinitis pigmentosa and refractive errors. Telescopes were prescribed for children, most of whom had Stargardt disease. Near glasses and magnifiers were prescribed to age-related macular degeneration (ARMD) cases and post laser patients. Patients obtained about 83 % of the prescribed devices (Figure 6). Telescopes improved blackboard work while near magnifiers improved the near visual acuity by magnifying the targets.

These patients were also taught the methods of using the devices for their daily living skills and counseling for educational and vocational needs was also provided.



**Figure 5:** Frequency of low vision aids prescribed and obtained

These patients used the prescribed glasses efficiently; however, they had difficulty in focusing the target with the telescopes and most of the patients complained of tiredness while using it for a long time.

### Discussion

Low vision is a very important public health problem (Kim et al, 2010). Worldwide, with increasing life expectancy, the incidence and prevalence of low vision is increasing. One of the hospital-based study in India showed the prevalence of low vision to be around 3 % (Khan, 2000). The prevalence of low vision patients in our hospital-based study is less than projected by the NNJS (NNJS 2012). This might be due to the fact that most of the patients in our study were from India and from poor background. These referred low vision patients hardly visit low vision clinics. Thus, there is a need to find out the constraining factors that limit the patients to visit low vision clinic. Besides, there is a need of proper counseling of these low vision patients as well.

There was less representation of female patients in our study as compared to their male counterparts. Some of the other studies done in India (Khan, 2000) and Nigeria (Olusanya et al,

2012) also had a similar male predominance. One of the surveys on gender equity among eye hospitals of Nepal (Upadhyay et al, 2010) also showed lower hospital visits of female patients. The lower representation of female patients might be due to various factors including literacy, awareness and social constraints.

Most (995, 53.4 %) of the patients presenting to our low vision clinic were of less than 40 years of age. Similar studies in India and Korea also had a younger age-group predilection for the low vision patients (Kim et al, 2010; Khan, 2000). Probably, the visual demand for their activities and their better awareness of low vision might be the driving forces of these young patients for their hospital visits.

Low vision referral patients were predominantly involved in agriculture related activities. This might be due to the fact that about 80 % of the Nepalese people and people from the bordering areas of India are agriculture dependent.

As in other studies (Khan, 2000; Olusanya et al, 2012), besides the refractive error, retinal problems accounted for most of the low vision appointments. Macular dystrophies were common retinal problem (Khan, 2000; Olusanya et al, 2012). There were 226 (12.1 %) cases of retinitis pigmentosa with 144 (7.8 %) cases of optic atrophy. Some of the retinitis pigmentosa patients had associated optic atrophy. The other causes for optic atrophy were glaucoma, optic neuritis and trauma. On the other hand, a similar study done in South Korea (Kim et al, 2010) had a much higher percentage of optic atrophy cases.

Diabetes mellitus is becoming a worrisome condition today. Large numbers of diabetics in the developing world have risk of developing diabetic retinopathy and its consequences. We had 111(6 %) low vision patients with diabetic retinopathy and its sequel. However, different studies had a variable frequency of diabetic retinopathy patients at their low vision clinics



(Kim et al, 2010; Khan, 2000; Olusanya et al, 2012; Elliott et al, 1997; Wolffsohn et al, 1999). We had low vision patients from India too; hence the frequency of ocular involvement among diabetic retinopathy patients in this study could not be compared with the actual prevalence of retinopathy among the Nepalese patients.

Age-related macular degeneration (ARMD) is one of the leading causes for low vision in developed countries. However, this is less applicable here as far as our study is concerned as we had only 93 (5 %) cases of ARMD. This correlates with the studies done in other developing countries (Khan, 2000; Kim et al, 2010; Mohidin et al, 1998; Poudel et al, 2005) where ARMD is not among the top three leading causes for low vision. On the other hand, in developed countries, ARMD is still among the leading causes for low vision (Olusanya et al, 2012; Elliott et al, 1997; Wolffsohn et al, 1999).

In our study, we had 105 (5.6 %) cases of microphthalmos. Most of them were of less than 30 years and the cause was possibly congenital. Similar findings were reported in another study done in Nepal (Sapkota et al, 2011).

The improvement of 67 % and 54.5 % in distance and near visual acuity was one of the major achievements in these low vision patients. However, 33 % of our patients showed no improvement with optical devices. Post laser therapy, retinitis pigmentosa, microphthalmos was seen in the majority of these patients.

Various optical and non-optical devices were prescribed to these patients as per their requirement. The optical devices were near and distance spectacles, telescopes and hand-held magnifiers. These people were also taught the method of using these devices. Non-optical devices and methods, like protection from light, wearing a hat for glare protection, using a table lamp, reading guides, signature guides and mobility canes were also advised. These

patients used the prescribed low vision devices and some of them also encountered problems in using them, especially the telescope.

There is no curative treatment for most of the visually-impaired patients; but there is an important role of low vision professionals and ophthalmologists in aiding people with low vision to perform their routine activities.

The limitation of this study was the lack of follow up of these patients, as we do not know the status with respect to the use of low vision devices and their usefulness. Besides, certain parameters like field of vision was not known.

### Conclusion

The problem of low vision is common in the younger and older age people, with variability in the causes among developed and developing nations. Retinal causes are common. Low vision devices needs to be prescribed with follow up of these prescribed patients regularly. A multi-centre study on low vision profile would be useful for better planning and management of low vision services in Nepal.

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**Source of support: nil. Conflict of interest: none**