

Article ▶ Profile of Low Vision Population Attending Low Vision Clinic in a Peripheral Eye Hospital in Nepal

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ABSTRACT

Background: Blindness and low vision are major causes of morbidity and constitute a significant public health problem, both detrimental to the quality of life for the individual and an economic burden on the individual, family, and society in general. People with low vision have the potential for enhancement of functional vision if they receive the appropriate low vision services. The present study aims to determine the profile of the low vision population attending a low vision clinic at a peripheral eye hospital in Nepal.

Methods: The low vision evaluation report cards of all the patients attending the low vision clinic at Biratnagar Eye Hospital between January 1, 2010 to March 31, 2012 were retrospectively reviewed.

Results: Out of 396 low vision patients, 280 (70.71%) were males and 116 (29.29%) were females. The age range of patients was from six to 89 years, with a mean of 43.29 ± 11.06 years. Retinitis pigmentosa (70, 18%) and macular diseases except age related macular degeneration (AMD) (55, 14%) were the most common causes of low vision. Nystagmus and amblyopia (34, 26.36%), retinitis pigmentosa (49, 23.33%) and AMD (16, 28.07%) were the most common causes of low vision in the 0-15, 16-60, and >60 years age groups, respectively. Telescopes (52, 39.10%) and stand magnifiers (45, 33.83%) were the most commonly prescribed low vision devices.

Conclusion: Hereditary anomalies and age related degeneration constitute the major causes of low vision in the study population. Telescopes and stand magnifiers were the most commonly prescribed and preferred low vision devices. The burden of visual impairment can be tackled in an effective way through the provision of quality and affordable low vision services and also provide a basis for national and regional level planning to combat visual impairment.

Keywords: low vision clinic, macular diseases, rehabilitation, retinitis pigmentosa, visual impairment

Introduction

Blindness and low vision are major causes of morbidity and have profound effects on quality of life. They inhibit mobility and economic well-being of the individuals affected, as well as their families.¹ Low vision services have suffered from neglect in organized eye care, even in most industrialized countries, despite the efforts of some international institutions. In low-income countries, the coverage has been negligible.² However, utilization rates of low vision services are universally low. It has been estimated that very few people with low vision, possibly only 5-10%, actually use low vision rehabilitation services. Poor utilization of services, including lack of awareness of low vision services among patients, as well as lack of knowledge of rehabilitation services and low vision referral rates among eye care practitioners, are amongst the established reasons.³

The term low vision has many definitions. It is often referred to as visual impairment, visual disability, or partial sight, but in general it is any loss of functional vision that persists after the correction of distance refractive error and common eye-related or surgical presbyopia.⁴ It is argued that low vision is a disability as opposed to an impairment. Low vision refers to an inability to perform everyday tasks,

such as reading or recognizing faces, resulting from a visual impairment. Therefore, it can also be said to be a consequence of visual impairment. Low vision may also be defined objectively by task performance or subjectively by self-reported task difficulty.⁵

The World Health Organization (WHO) defines a person who needs low vision care as “someone who has an impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task.”⁶

The WHO has classified the visual status of a person in four categories:

- i. a person having best corrected vision, in better eye, better than or equal to 6/18 is said to have normal visual status;
- ii. a person with best corrected vision, in better eye, <6/18 to 6/60 is said to have moderate visual impairment;
- iii. a person having best corrected vision, in better eye, <6/60 to 3/60 is said to have severe visual impairment;

- iv. a person having visual acuity $<3/60$ is said to be blind.

According to the WHO in 2004, there were 314 million people with visual impairment in the world; 45 million were blind, 124 million were classified as having low vision after best correction, and 145 million people world wide were visually impaired due to uncorrected distance refractive error causing distance vision problems.⁷ About 80% of visual impairment can be prevented or cured.⁸

It was therefore estimated that about 65 million persons with visual impairment have ‘true’ low vision that would require low vision rehabilitation. However, with the effective application of Vision 2020: The Right to Sight program and the appropriate interventions, these figures have been reduced. Globally, 285 million people in the world are visually impaired, of whom 39 million are blind and 246 million have low vision.⁸

Nearly 87% of the world’s blind people live in the developing countries.⁹ More than half of them live in Asia, and a vast majority of them are in rural communities.¹⁰ Many reasons have been identified for the rising tide of blindness and low vision. Prominent among them is the increase of the world’s elderly population, particularly in developing countries.¹¹

The prevalence of blindness in Nepal is 0.39%, of which 80% is avoidable or preventable.⁸ The higher percentage of avoidable blindness reflects the reduced health access of the community due to improper health education and poor financial conditions as a result of political instability.¹¹ The distribution of the causes of low vision in Nepal appears to vary depending on location.^{12,13} It is therefore important to determine the common causes of low vision in different age groups in different parts of the country.

The burden of low vision is huge, and therefore, data on the provision of low vision services has become necessary for planning quality low vision care. This paper reports the results of a retrospective study of the low vision clinic population at Biratnagar Eye Hospital, Nepal. Of particular interest is the identification of the common causes of low vision in different age groups and the types of low vision devices prescribed. This will help to identify deficiencies in the model of current service and also provide a guideline to develop low vision services in other parts of Nepal, as well as other developing countries.

Methodology

The low vision evaluation reports of all the patients attending the low vision clinic at Biratnagar Eye Hospital between January 1, 2010 and March 31, 2012 were retrospectively reviewed. The information extracted included age, sex, nationality, education level, profession, causes of low vision as identified by ophthalmologists, chief visual demand and difficulties, presenting distance and near visual acuities, best corrected visual acuities for near and distance, visual

Table 1: Distribution of low vision patients according to gender and nationality

Nationality	Gender		Total
	Male	Female	
Nepali	79 (28.21%)	45 (38.79%)	124 (31.31%)
Indian	201 (71.78%)	71 (61.21%)	272 (68.69%)
Total	280	116	396 (100%)

Table 2: Distribution of low vision patients by age and gender

Age	Male	Female	Total
0-15 years	85	44	129 (32.58%)
16-60 years	152	58	210 (53.03%)
>60 years	37	20	57 (14.39%)
Total	280 (70.79%)	116 (21.21%)	396 (100%)

acuities with low vision devices, and their preference and types of low vision devices prescribed. The WHO working definition of low vision (BCVA of $<6/18$ to light perception) was used in this study. All patients were seen by the ophthalmologist and optometrist before referral to the low vision clinic.

Bilateral blindness was defined as best corrected visual acuity of less than $3/60$ in both eyes, and unilateral blindness was defined as best corrected visual acuity of less than $3/60$ in only one eye. When there was more than one disorder mentioned in the patient’s records, the cause that led to the last event rendering the individual sightless was chosen.

All patients had undergone a detailed low vision evaluation in the low vision clinic. Distance visual acuity was recorded in logMAR units, while near visual acuity was recorded in M notation after testing at the patient’s working distance with preferred light condition for reading. Objective and subjective refraction was carried out in all cases, and proper refractive correction was prescribed in spectacle form. A trial of telescopes was carried out for suitable patients, and visual acuities with the telescopes were noted. The near magnifiers of appropriate magnification were demonstrated on the basis of equivalent viewing power (EVP), and the near visual acuity was noted along with the patient’s near magnifier preference. The optical low vision aids were prescribed as per the patient’s preference. Data were entered into SPSS 17 program and analyzed.

Results

A total of 396 clinical case records were reviewed: 280 (70.71%) were males and 116 (29.29%) were females. The distribution of the low vision patients according to gender and nationality is shown in Table 1.

The age range of patients was from six to 89 years with a mean of 43.29 ± 21.06 years. There were 129 (32.58%) patients in the 0-15 years age group, 210 (53.03%) patients in the 16-60 years age group, and 57 (14.39%) patients in the >60 years age group, as shown in Table 2.

Out of 396 patients, 129 (32.58%) were bilaterally blind, whereas 267 (67.42%) had moderate and severe

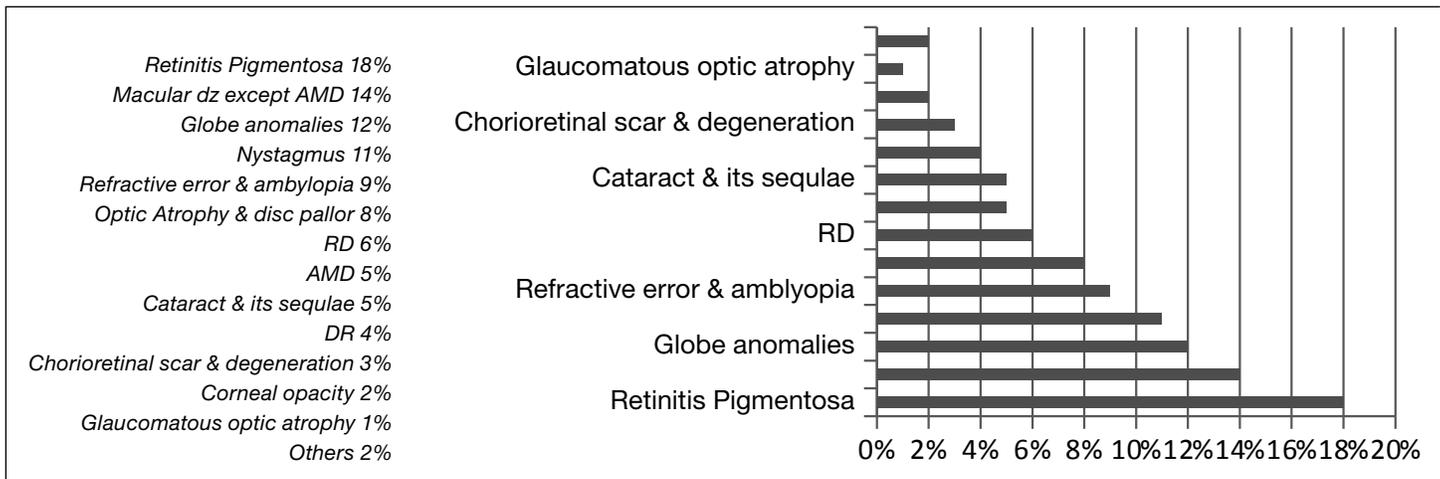


Figure 1. Causes of low vision in patients attending low vision clinic

Table 3: Table showing causes of low vision in different age groups.

Causes	0-15 (n=129)	16-60 (n=210)	>60 (n=57)
0-15 years	85	44	129 (32.58%)
16-60 years	152	58	210 (53.03%)
>60 years	37	20	57 (14.39%)
Total	280 (70.79%)	116 (21.21%)	396 (100%)
Retinitis pigmentosa	14.73%	23.33%	3.51%
Macular dz except AMD	7.75%	18.10%	12.28%
Globe anomalies	23.26%	8.10%	3.51%
Nystagmus	26.36%	5.24%	0.00%
Refractive error and amblyopia	7.75%	11.43%	0.00%
Optic atrophy and disc pallor	10.08%	7.14%	7.02%
RD	0.00%	7.62%	10.53%
AMD	0.00%	1.90%	28.07%
Cataract and its sequelae	4.65%	4.76%	3.51%
DR	0.00%	3.33%	14.04%
Chorioretinal scar and degeneration	0.00%	2.86%	10.53%
Corneal opacity	4.65%	0.95%	0.00%
Glaucomatous Optic atrophy	0.00%	1.90%	3.51%
Miscellaneous	0.78%	3.33%	3.51%

visual impairment. A significant number of patients (n=207, 52.27%) also had unilateral blindness, although visual impairment and unilateral blind categories overlapped.

The causes of low vision in patients attending the low vision clinic are shown in Figure 1. Retinitis pigmentosa (18%) and macular diseases except age related macular degeneration (AMD), which included macular scars, dystrophy, edema, hole, Stargardt's disease, and toxic maculopathy (14%), were the most common causes of low vision. Nystagmus (26.36%)

and globe anomalies (23.26%) were the most common causes of low vision in the 0-15 years age group. Retinitis pigmentosa (23.33%) and macular diseases (18.10%) were the most common causes in the 16-60 years age group, whereas AMD (28.07%) was the most common cause of low vision in the >60 years age group (Table 3).

The low vision devices most commonly prescribed were distance telescopes (52, 39.10%), stand magnifiers (45, 33.83%), hand held magnifiers (20, 15.04%) and spectacle magnifiers (16, 12.03%).

Discussion

Since its start in September 2006, Biratnagar Eye Hospital has grown rapidly from 100 to 450 beds and progressed into an eye hospital widely recognized for delivering affordable high quality eye care services to the economically poor and under-privileged people of the community. Located in Eastern Nepal close to the Indo-Nepal border, this hospital has been serving thousands of patients, in particular, people from Eastern Nepal and Northern parts of India including Bihar, Uttar Pradesh, and West Bengal, with the highest quality of eye care. Of the low vision patients in this study, 68.69% were of Indian origin whereas only 31.31% were of Nepali origin. This is due to the location of the hospital close to the Indo-Nepal border and the free access into both countries.

There have been contrasting reports on the distribution of low vision patients by gender. Several previous studies¹⁴⁻¹⁶ have shown a predominance of females in their low vision clinic population. However, in a study performed by Shad et al. in Pakistan, a greater proportion of low vision patients were male (73.8%).¹⁷ In another study performed in Malaysia by Mohiddin and Yousuf,¹⁸ the male to female ratio of low vision patients was 2.21:1. Barbie,¹⁹ in reporting the characteristics of the Nigerian low vision population in Evangelical Church of West Africa (ECWA) eye hospital, found that 70.3% of the study population was male. Consistent with the studies in the developing countries, the ratio of males to females was 2.41:1. This signifies a greater prevalence of low vision in the male population, however, it may also be confounded

by widespread gender-based discrimination in this part of the world and by males having easy access to the hospitals. In Nepal and in parts of India like Bihar and Uttar Pradesh, there is huge discrimination based on gender. Females have to depend upon males for every aspect of daily living and decision making. The gender-based discrimination has limited the independence of women in terms of health and educational opportunities, mobility, and decision making. Such structure of the societies means that females are always lagging far behind regarding health education and financial control, making their access to hospitals even more difficult. Moreover, as males have more economic power as head of the family and bread winner, males seek health access to live up to their family expectations. This signifies a greater need for community-based screening programs targeting the female population in this part of the world.

There have been several reports on low vision clinic populations, but our results are not in agreement with them. A higher proportion of older people in their clinic population has been shown,¹⁴⁻¹⁶ but our results showed otherwise, with nearly 85% of low vision patients being less than 60 years of age (Table 1). This is in agreement with the study by Mohidin et al.²⁰ in which 73.8% of the low vision patients were younger than 60 years. The fewer number of patients in the age group >60 years might be due to lower life expectancy (65.81 years) in the country. It is also the result of a majority of the elderly population staying idle and dependent more upon the next generations in this part of the world. Most of the people above the age of 60 years in this part of the world do not feel the necessity of improved health status and are ready to accept their disability. It may also be due to the lack of awareness of available low vision services.

Nearly one third of low vision patients in our study population were children aged less than 16 years. This indicates that special education integrated with visual rehabilitation should be included as a national program. Children are often regarded as the future pillars of the nation and have to spend a long duration of their life being visually impaired if low vision services are not made accessible to them.

Retinitis pigmentosa (18%), macular diseases except AMD (14%), and globe anomalies (12%) were the most common causes of low vision in the study population. This is in agreement with the study performed in Pakistan in which structural defects of the globe (13%), retinitis pigmentosa (13%), and macular dystrophy (10%) were the most common causes.¹⁸ However, this is in contrast with studies performed in other parts of the country. In a report from Kathmandu, diabetic retinopathy and macular diseases were identified as the most common causes.¹² In another report from Lumbini, cataract and its sequelae, along with refractive error and amblyopia, were the predominant causes.¹³

The major causes of low vision in this study (Figure 1) can be compared to the findings of several other studies. In England and Wales, the main causes of low vision were AMD

(56%), glaucoma (10.2%), diabetic retinopathy (7.4%), hereditary retinal disorders (2%), and optic atrophy (1.9%).²¹ In Malaysia the main causes were reported as cataract and aphakia (18.2%), retinitis pigmentosa (10.5%), diabetic retinopathy (7.3%), and AMD (7.3%).²² In Iran the most common causes were AMD (19.9%), congenital diseases (17.5%), retinitis pigmentosa (16%), diabetic retinopathy (12.4%), and cataract (7.3%).²³ This signifies the variation in the causes of low vision in the developing countries like Nepal and India from that of the Western world. Also, there is greater distribution in the causes of low vision in different parts of the country. This highlights the need for different policies that need to be carried out at the regional level in order to improve the quality of life of the visually impaired.

The causes of low vision were also analyzed separately in different age groups (Table 4). Nystagmus (26.36%) and globe anomalies (23.26%) were the most common causes of low vision in the 0-15 years age group. In a study performed by Elfadul Mohamed and Binnawi,²⁴ retinitis pigmentosa was the most common (16.7%), followed by congenital cataract (14.2%). The higher proportion of paediatric low vision in this study, as well as nystagmus being the common cause, signifies the greater need for planning and effective implementation of pre-school and school screening programs. Retinitis pigmentosa (23.33%) and macular diseases (18.10%) were the most common causes in the 16-60 years age group, whereas AMD (28.07%) was the most common cause of low vision in the older than 60 years age group. This is in agreement with the results shown by Mohidin and Yusoff.¹⁸ In this study AMD accounts for only 5% of the total low vision population. This is in contrast with the studies in developed countries,²¹ probably due to the relatively small proportion of low vision patients in the greater than 60 years age group presenting to the hospital. The higher number of low vision patients with retinitis pigmentosa in the 16-60 years age group is probably due to late presentation of the patients or delayed diagnosis, even though being affected in early childhood.

Out of 396 low vision patients, 129 (33%) were bilaterally blind and 125 (31%) had severe visual impairment. This result is similar to the study by Elfadul Mohamed et al.²⁴ The higher number of bilaterally blind persons reflects the poor health awareness and accessibility to health services in this part of the country. This also prompts the need for greater numbers of low vision referrals of the patients with moderate visual impairment when visual rehabilitation can be achieved in an effective way.

Among the optical low vision aids, telescopes were the most commonly prescribed device (39.09%) for distance and stand magnifiers (33.83%) for near. Only 33.58% of the subjects benefitted from optical low vision aids during the study period, in contrast to 82.37% of the subjects in a report from Sudan.²⁵ This low figure is probably due to the high number of bilaterally blind patients with poor residual vision and also due to the lack of availability of optical aids such as Closed Circuit Televisions (CCTVs), telemicroscopes, sheet

magnifiers, bioptic telescopes, etc. Studies carried out in India²⁶ and West Africa²⁷ indicate that more than half of low vision patients show an improvement with low vision devices after an assessment. Low vision optical aids are therefore an effective means of improving visual performance, thus helping to provide visual rehabilitation to the population with visual disability.²⁵

Conclusion

The low vision service through the low vision clinic in the peripheral tertiary eye hospital in Nepal is satisfactory in terms of the number of patients attending the clinic, but a large number of patients presenting to the clinic are bilaterally blind. In developing countries like Nepal, community-based screening programs can play a huge role in visual rehabilitation of this population prompting early referrals. For this, greater communication between low vision services and other community-based services along with prioritization of low vision programs is imperative.

Hereditary conditions and age related degenerations are the major causes of blindness in this part of the world. Consanguineous marriage should be discouraged, and genetic counselling should be done when a hereditary retinal disease is suspected. Telescopes and stand magnifiers are the most prescribed and the most preferred low vision devices in the clinic. There appears to be a greater need for making other optical and non-optical devices available at these clinics to enhance the rehabilitative process.

Low vision has emerged as a major challenge faced by the world and more so in the developing countries. This study has shown that the burden of visual impairment can be tackled in an effective way through the provision of quality and affordable low vision services. Identification of patients with low vision and their prompt referrals will serve better towards improving the quality of life of the visually impaired population.

References

1. Minto H, Awan H. Guide lines for setting-up a low vision programme for children. *Community Eye Health J* 2001;14:60-1.
2. Pararajasegaram R. Low vision care: The need to maximize visual potential. *Community Eye Health J* 2004;17:1-2.
3. Pollard T, Simpson J, Lamoureux E, Keeffe J. Barriers to accessing low vision services. *Ophthalm Physiol Opt* 2003;23:321-7.
4. Barbara B. *The Low Vision Hand Book*. Thorofare, NJ; Slack Incorporated, 1997,1-5.
5. Johnson GJ, Foster A. Prevalence, Incidence and Distribution of Visual Impairment. In: Johnson GJ, Minassian DC, Weale RA, Sheila KW, eds. *The Epidemiology of Eye Disease*, 2nd ed. London: A Hodder Arnold Publication, 2003;13-28.
6. World Health Organization. *The Management of Low Vision in Children. Report of a WHO Consultation: Bangkok, July 1992*. 1993. (WHO/PBL/93.27)
7. World Health Organization. *Magnitude and causes of visual impairment*. WHO media centre. [Internet]. 2004. Available at: <http://bit.ly/WHOmedia>. Last Accessed April 21, 2012.
8. World Health Organization. *Mid-term review Vision 2020: The Right to Sight, Nepal*. October 2011.
9. Siddiqui A, Backman O, Awan HR. Multidisciplinary approach in the development of comprehensive low-vision services in developing countries. *Eastern Mediterranean Health J* 1997;3:149-53.
10. Nepal facts and figures. The Fred Hollows Foundation. [Internet]. 2010. Available at: <http://www.fredhollows.org>. Last Accessed April 21, 2012.
11. Thakur AK, Joshi P, Kandel H, Bhatta S. Profile of low vision clinics in Eastern Region of Nepal: A retrospective study. *Br J Vis Impairment* 2011;29:215-26.
12. Paudel P, Khadka J, Sharma A. Profile of a low vision population. *International Congress Series – Proceedings of the International Congress Vision 2005*; 1282:252-6.
13. KC BK, Thapa HB, Gurung S, Sherchan A, et al. Hospital Based Study on Causes of Low Vision and Patient Preference for Different Types of Low Vision Devices. *Journal of Institute of Medicine* 2007;29(2):19-24.
14. Robbins HG. Low vision care for the over 80s. *Aust J Optom* 1981;64:243-51.
15. Jackson AJ, Silver JH, Archer DB. An Evaluation of Follow up Systems in Two Low Vision Clinics in the United Kingdom. In: Woo GC, ed. *Low Vision: Principles and Applications*. Berlin: Springer-Verlag, 1987:396-417.
16. Hill AR, Cameron A. Pathology Characteristics and Optical Correction of 900 Low Vision Patients. In: Woo GC, ed. *Low Vision: Principles and Applications*. Berlin, Springer-Verlag, 1987:362-85.
17. Shad M, Daud Khan M. Causes of low vision amongst the low-vision patients attending the low vision clinic at Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad Medical Complex Peshawar, Pakistan. *Vis Impairment Res* 2004;6:89-97.
18. Mohidin N, Yusoff S. Profile of a low vision clinic population. *Clin Exp Optom* 1998;81:198-202.
19. Barbie ME. Characteristics of the Nigeria low vision population. *JNOA* 2004;11:6-10.
20. Nepal life expectancy at birth. [Internet]. 2010. Available at: <http://bit.ly/NepalLife>. Last Accessed April 21, 2012.
21. Leat SJ, Rumney NJ. The experience of a university-based low vision clinic. *Ophthalm Physiol Opt* 1990;10:8-15.
22. Omer R, Mohidin N, Mohammed Z. Trend of low vision patients attending a low vision clinic in Kuala Lumpur, Malaysia. *International Vision Rehabilitation Symposium, Hong Kong SAR, China; 2004:May 27-28*.
23. Riazi A, Parhizgar SH. Causes of Low Vision and Patient Preference for Different Types of Visual Aids: A Pilot Study. *Visual Impair Res*. Taylor and Francis: 7(2-3):85-9.
24. Elfadul Mohamed IA, Binnawi KH. Low vision devices in Sudanese children. *Sudanese J Ophthalmol* 2009;1:37-40.
25. Mohammad Ali AB, Khalil AL, Azmat S. Causes and vision enhancement of low vision patients at Makkah Eye Complex, Khartoum. *Khartoum Med J* 2012;2(2):206-11.
26. Peter H, Vijaya KG. Survey of visual impairment in an Indian tertiary eye hospital. *Indian J Ophthalmol* 1997;45:189-93.
27. Ager LR. Optical Services for visually impaired children. *J Comm Eye Hlth* 1988; 11(27):38-40.

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