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ORIGINAL ARTICLE

CLINICAL ANALYSIS OF LOW VISION AIDS

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ABSTRACT: AIM: to clinically analyze 50 cases of low vision patients attending tertiary care hospital, their acceptance of low visual aids and to identify common ocular conditions leading to low vision. **METHODS:** A two year prospective study was done and fifty patients with low vision who attended the low vision clinic were examined for low visual aids acceptance and improvement of acuity, fields or ability to carry out daily activities. Patients underwent clinical low vision examination and they were assessed for low visual aids prescription and the kind of low visual prescribed for distance and near tasks. **RESULTS:** The age distribution showed maximum number of patients were in the age group of 51-60 years with male preponderance of 72 %. The most common disease causing low vision were retinitis pigmentosa followed my macular dystrophy, diabetic retinopathy and age related macular degeneration. Other diseases were POAG, myopic macular degeneration, optic atrophy and nystagmus. Spectacle magnifiers were most commonly prescribed in 44% for distant vision followed by telescopes in 38% of patients for near vision. Field expanders were prescribed for patients with advances glaucoma and retinitis pigmentosa. Other near vision aids included hand magnifiers, stand magnifiers and CCTV. Both the distant telescopes and magnifiers for near vision improved the visual acuity by three lines which improved further on increasing the illumination. In patients with extensive scotomas of near fixation point, hand and stand magnifiers were better than spectacle magnifier. **CONCLUSION:** The study shows that low visual aids can be prescribed in various ocular diseases depending upon occupation, age and needs of the patient. Low visual aids help patients to make use of remaining vision to maximum extent so that they utilize residual vision effectively to meet their daily requirement

KEYWORDS: low vision, distant, near visual aids.

INTRODUCTION: According to WHO more than 161 million were visually impaired with 37 million people blind and 124 million people with low vision.[1] Low vision in children may cause life-long visual performance reduction unlike adults. There are about 45 million visually handicapped people in India. At least 30 million of them are not totally blind but partially sighted.[2] Their condition cannot be corrected optically by spectacles or contact lenses. Low visual aids are useful in significant number of people.

The following is WHO definition of Low vision which is widely used internationally ' A person with low vision is one who has impairment of visual functioning even after treatment for example on operation and/or standard refractive correction (Has been given glasses or lenses) and has visual acuity of less than 6/18 to light perception or a visual field of less than 10 degrees from the point of fixation (that is 20 across) but who uses or is potentially able to use vision for the planning and/ or execution of task.[3]

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The low vision is described as moderate for vision 6/24-6/36, severe for 6/60-3/60. In low vision care the ophthalmologist, optometrist, rehabilitation and mobility instructor, counselor, educator all play active roles.[4]

Studies of life quality in visually impaired are associated significantly with emotional distress, decreased quality of life and decreased functional status. Small print size is the major barrier for reading in children with low vision.

Low vision services are associated with improved visual function, better quality of life and high rate of patient satisfaction.[5]

INCLUSION CRITERIA:

1. Patients with best-corrected visual acuity less than 6/18.
2. Patients with visual field less than 20 degrees with normal visual acuity (greater than 6/18).

EXCLUSION CRITERIA:

1. Patients in whom cataract was the cause of reduced acuity.
2. In patients were trauma has caused structural damage to the eye and has reduced his visual acuity.

MATERIAL AND METHODS: This is a prospective analysis done in Tertiary Care Hospital for the period of 2 years. Fifty patients with low vision who attended the low vision clinic were examined for low visual aids acceptance and improvement of acuity, fields or ability to carry out their daily activities.

Patients underwent clinical low vision examination. Data included age, sex, occupation, diagnosis, visual acuity before and after low visual aids prescription and the kind of low visual aids prescribed for distance and near tasks.

AFTER TAKING THE HISTORY THE FOLLOWING SEQUENCE OF TESTS WAS PERFORMED:

1. Measurement of visual acuity for each eye and improvement with pinhole.
2. Cover test to know the preferred fixing eye, if monocular units need to be prescribed.
3. Slit lamp examination.
4. Fields are charted with Bjerrums screen, Amslers grid and confrontation.
5. Conventional refraction was done and best-corrected visual acuity was identified.
6. If best-corrected distance visual acuity is less than 6/18 improvement of acuity with distance telescopes was identified and prescribed.
7. Then near vision was tested later and if near vision was found defective magnifiers in the form of spectacles, hand and stand magnifiers was tried. If the patient did not improve with these magnifiers closed circuit television was used.

Full diameter trial lenses in trial clips should be used in cases of eccentric viewing, nystagmus.

RESULTS: A total of 50 patients were studied for low vision analysis. Males comprised of 72% (36) and female 28%. The age distribution showed that maximum number of patient were in the 51-60 years age group 22%, 4% were below 10 years and 8% above 60 years. (TABLE 1) Patients in 10-20 age group and 40-50 age group comprised 20% each.

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The most common diseases causing low vision were Retinitis pigmentosa (RP) 28%, macuiar pathology 20%, diabetic retinopathy 14%, and age related macular degeneration (ARMD) 14%. Other ocular disorders included primary open angle glaucoma 10%, myopic macular degeneration, optic atrophy and nystagmus 4% each. (TABLE 2) Labourer's and house wives were the major number of people who attended the low vision clinic. Labourer's accounted for 22%, housewives 20%. Students were the next common group 18% followed by retired persons 18%. 10% were government servants. (TABLE 3)

Spectacle magnifiers were most commonly prescribed in 44% of patients followed by telescopes in 38% of patients. Cumulatively distance telescopes were prescribed in19 patients, field expanders in 13 patients and near visual aids in 43 patients. Some patients improved with both near and distance visual aids but they preferred near magnifier. (TABLE 4)

Telescopes were the most commonly prescribed distance visual aid in 38%. For near vision spectacle magnifiers were the most common followed by hand magnifiers in 10 patients and closed circuit television in 9 patients.

Patients who were prescribed distance telescopes had approximately three lines improvement of visual acuity in Snellen's chart. Magnifiers for near vision also improved near vision by three lines. Increased illumination had additive effect on near vision in 20% of patients.

Patients who failed to improve with the available low visual aids were referred to improve daily living skills by orientation and mobility training, sent to rehabilitation center and schools for visually handicapped, and given social counselling. One patient with optic atrophy could not be improved was sent to rehabilitation center.

The choice of visual aids differed in different groups of people. Labourer's who were the majority had telescopes and magnifiers prescribed equally. In housewives telescopes were prescribed in 7 patients and magnifiers in 7 patients but most of them preferred magnifiers. In students magnifiers were the most common followed by field expanders in 4 and telescopes in 3 patients. In retired persons magnifiers were the most common in 7 patients and telescopes in 1 patient only. In government servant's magnifiers were prescribed in 3 of the 5 patients. (TABLE 5 AND 6)

In relation to ocular diseases, field expanders were prescribed in 11 of 14 patients with Retinitis pigmentosa and the remaining were prescribed magnifiers. In macular diseases telescopes were prescribed in 8, magnifiers in 7 patients and CCTV in 4 patients. In diabetic retinopathy 6 patients were prescribed magnifiers and 3 with telescopes for distant vision. In age related macular degeneration 6 were prescribed magnifiers 2 each with telescopes and CCTV. In POAG patients, field expanders were prescribed in 2 out of 5 patients who had advanced tubular vision.

DISCUSSION: The study showed that most of patients who came to low vision service were provided with low visual aids, which indicates the effectiveness of low vision aids in visual rehabilitation of visually handicapped.

The majority of patients who visited low vision clinic were males (72%). This may be due to more activities and visual demands in work for males. This is similar to study by Khan SA.[6,7]

Patients under 30 years of age accounted to 40% of the total. They were diagnosed mostly with retinitis pigmentosa and macular dystrophy. Patients between 30 to 60 years were 52% who are the economically productive people. Patients over 60 years accounted 8%.

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In retinitis pigmentosa field expanders were commonly prescribed in 11 of the 14 patients. Since they reduce the visual acuity patients felt better without them as they are better accustomed to their task by different head postures. Some with macular involvement in retinitis pigmentosa did well with magnifiers for near vision.[8,9]

In macular dystrophy, diabetic retinopathy (Maculopathy) and age related macular degeneration, magnifiers in the form of spectacles, hand and stand magnifiers were commonly prescribed. In patients with extensive scotomas of near fixation point, hand and stand magnifiers were better than spectacle magnifiers. Spectacle magnifiers were most commonly prescribed low visual aids for near vision in 22 patients which is similar to study by Mc Curry et al.[10] Since spectacles are most commonly seen and cosmetically acceptable, this seems to be commonly accepted aid even in children.

Telescopes were next common aid accepted by 19 patients and they worked well in sedentary work such as viewing television at fixed distances. Hand magnifiers and stand magnifiers in 12 patients who could not use spectacles since they need more magnification or had scotomas in central field.[11]

Hand magnifiers were difficult in old people with tremors and they had restricted them for short-term use. Closed circuit television was useful in 9 patients who could not be helped with magnifiers but their costs put them at disadvantage.

In housewives magnifiers were commonly accepted, as they felt comfortable with magnifiers at home as their tasks were limited. The same was seen in old (retired) people at home with 7 of the 9 people preferring magnifiers.

Students experimented with telescopes, field expanders and magnifiers depending on their tasks and requirements. In spite of all these magnifiers were commonly used for near work when compared to others.

CONCLUSION: The study shows that low visual aids can be prescribed in various ocular diseases, depending upon the need of the patient.

Most patients benefited from spectacle magnifiers irrespective of the age and disease of the patients particularly for near work.

Low visual aids help patients make use of remaining vision so that their daily living becomes easier, they enjoy the independence and perform necessary tasks. With the combination of best refractive correction, optical and non-optical aids and electronic devices most visually handicapped people can utilize residual vision effectively to meet their daily visual requirements.

In patients who could not be helped by low visual aids, appropriate referral for support services like orientation and mobility training, vocational training and special education is a must.

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Age group	Percentage
0- 10	4
11 - 20	20
21 -30	16
31 -40	10
41 -50	20
51 -60	22
61 and above	8

Table 1: Age Distribution

Occupation	Percentage
Labourers	22
House wife	20
Student	18
Retired persons	18
Government servants	10
Unemployed	6
Business	4
Others	2

Table 2: Occupation of patients

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Ocular diseases	Percentage
Retinitis pigmentosa	28
Macular dystrophy	20
Diabetic retinopathy	14
ARMD	14
Primary open angle glaucoma	10
Myopic degeneration	4
Optic atrophy	4
Nystagmus	4
Corneal dystrophy	2

Table 3: Ocular diseases causing low vision

Type of aids	No. of patients
Telescopes	19
Field expanders	13
Spectacle magnifier	21
Hand magnifier	10
Stand magnifier	1
CCTV	9

Table 4: Low visual aids prescribed

Occupation	Distance Telescopes	Field Expanders	Magnifiers			CCTV
			Spectacle	Hand	Stand	
Labourers	5	5	1	3	1	3
Housewives	7	1	4	4		2
Students	4	3	4			2
Retired	1		7	2		1
Govt. Servants		2	3			
Unemployed	1	1	2	1		
Business	l	1				1
Total	**19**	**13**	**21**	**10**	**1**	**9**

Table 5

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Diseases	Distance Telescopes	Field Expanders	Magnifiers			CCTV
			Spectacle	Hand	Stand	
Retinitis pigmentosa	2	11	3	2		1
Macular disease	8		3	3	1	4
Diabetic retinopathy	3		6			1
ARMD	2		6			2
POAG	2	2	1	2		
Nystagmus	1		1			1
Myopia	1					
Optic atrophy			1	2		
Corneal dystrophy				1		
Total	**19**	**13**	**21**	**10**	**1**	**9**

Table 6: Visual aids and disease distribution

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