TO STUDY THE PREVALENCE, COMPARISON AND CO-RELATION OF THE DIFFERENCES IN ACCEPTANCE AND THE IMPROVEMENT IN QUALITY OF LIFE IN PATIENTS OF AGE RELATED MACULAR DEGENERATION, DIABETIC RETINOPATHY AND MYOPIC DEGENERATION BY LOW VISION AIDS

[1]*Dr. Jaishree Dwivedi M.S., [2]Dr. Lokesh Kumar Singh, [3]Dr. Alka Gupta, [4]Dr. Anu Malik and [5]Dr. Sandeep Mithal M.S.

[1]Assistant Professor Upgraded Department of Ophthalomology L.L.R.M. Medical College, Meerut.
[2]Associate Professor Upgraded Department of Ophthalomology L.L.R.M. Medical College, Meerut.
[3]Professor Upgraded Department of Ophthalmology L.L.R.M. Medical College, Meerut.
[4]Associate Professor Upgraded Department of Ophthalomology L.L.R.M. Medical College, Meerut.
[5]Professor Upgraded Department of Ophthalmology L.L.R.M. Medical College, Meerut.

Corresponding Author: Dr. Jaishree Dwivedi M.S.

Assistant Professor Upgraded Department of Ophthalomology L.L.R.M. Medical College, Meerut.

ABSTRACT

Introduction
A person with low vision is one who has 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 task.

AIMS AND OBJECTIVE

The proposed study which was to study the prevalence of low vision, compare and correlate the differences in acceptance of low vision aids and the improvement in quality of life in patients with Age Related Macular Degeneration, Diabetic Retinopathy and myopic degeneration conducted in the "Upgraded Department of Ophthalmology, L.L.R.M. Medical College Meerut."

- There are no nationwide reliable data on refractive errors and low vision in the country except some isolated studies.
- The aims of the study included
- To study the prevalence of law vision in patients of
  - ARMD
  - Diabetic retinopathy
  - Myopic degeneration in our setup
- To compare and correlated the differences in acceptance of Low vision Aids in above subset of patients.
- To assess the improvement in quality of life after LVA prescription

MATERIAL AND METHOD

15 Patients each of Diabetic Retinopathy, Age Related Macular Degeneration and Myopic

Degeneration were included in study
Patients were prescribed both optical as well as non optical low vision aids and were given a visual functioning questionnaire before and after prescription of Low vision aids. This questionnaire was used to assess the improvement in quality of life.

OBSERVATION

From the observations we can conclude that
1. Patients of ARMD benefitted most with near low vision aids, while patients of pathological myopia benefitted most from distant low vision aids.
2. Patients of diabetic retinopathy were worst off with up to 9 patients not benefitting from any device.
3. Near Low Vision Aids were accepted more by patients of ARMD as comared to patients of DM & Myopic Degeneration.
4. Distance Low Vision Aids were accepted more by patients of Myopic Degeneration.
5. By applying Z test of proportions for independent groups at confidence interval of 95%, there was no statistical difference amongst the patients of ARMD, DM and Myopic Degeneration in the acceptance of both near and distance low vision aids.
6. Thus though patients of ARMD and Myopic Degeneration benefitted from the prescription of low vision aids, it appears that patients of Diabetes did

not benefit significantly in helping to improve the quality of their life.

7. Patients of diabetes perform worst than either patients of ARMD or myopia with trial of low vision devices. This can be partly attributed to the poor general conditions of diabetics. Also most of the patients of diabetic retinopathy lose out on central and peripheral vision due to disease and treatment respectively, while patients of ARMD are able to use some residual peripheral vision.

CONCLUSION

To conclude, in all more number of near low vision aids were accepted as compared to distance vision aids, although more patients came with problems for distance. All of the patients were described the uses and benefits of non optical visual aids. Attempts towards helping in rehabilitation were also made in conjunction with the department of rehabilitation.

KEYWORDS:
– ARMD
– Diabetic Retinopalhy
– Myopic chnortinal depended
– Low vision aid
– Rehabilitation

INTRODUCTION

Low vision
Definition
'Low vision' as limited to patients requiring low vision care is defined by the Bangkok definition.[1,2]

'A person with low vision is one who has 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 task.

Up to 80% of all visual impairment is avoidable by prevention, treatment or cure.[3] Top causes of visual impairment : refractive errors, cataracts and glaucoma. Top causes of blindness: cataracts, glaucoma and age-related macular degeneration.

What are low vision aids?
Low vision aids are devices which help people use their sight to better advantage. These aids may be optical lenses such as magnifiers or telescopes, or non optical devices, such as visors, filters, reading slits, stands, lamps and large print.

How do low vision aids work?
Low vision aids may make things larger: they may make things brighter, they may make things clearer, and they may improve contrast. All low vision aids make it easier to see something by magnifying it to the level one can see.

A person with 'normal' vision is someone who has between 6/6 and 6/12 (20/20 and 20/40) vision.

Vision Impairment
Refers to conditions with decreased visual acuity from blindness to partial sight.

Blindness
Is defined as, no usable vision with exception of light perception.

Economic Blindness
It is defined as, visual performance with distance visual acuity of 6/60 or less in the better eye with best ophthalmic correction or as a defect in visual field so that the widest diameter of vision subtends an angle no greater than 20 degrees.

Functional Vision Impairment
Functional impairment prevents or causes difficulty in performing tasks or daily activities.

Legal Blindness
It is the legal definition used to determine whether an individual with vision impairment is eligible for government benefits. It is 6/60 or less with best correction or a visual field of 20 degrees of less in the widest meridian of the better eye.

Visual rehabilitation are services provided to both who are partially sighted and those who are blind.

Table – 1:

CATEGORY	PRESENTING DISTANCE VISUAL ACUTIY	
	WORSE THAN	EQUAL TO OR BETTER THAN
0 Mild or no visual impairment		6/18
1 Moderate visual impairment	6/18	6/60
2 Severe visual impairment	6/60	3/60
3 Blindness	3/60	1/60
4 Blindness	1/60	1/60
5 Blindness	No Light Perception	

According to the WHO Low vision is limited to categories 0,1 & 2.[4]

Main causes of blindness in 50+ populations are as follows[5]

The main causes of blindness include

- Cataract
- Corneal Blindness
- Glaucoma
- Surgical Complications
- Posterior segment disorders

Main causes of Low Vision/Visual Impairment

Treatable causes of low vision include

- Cataract
- Glaucoma

Untreatable causes include

- Glaucoma
- Age Related Macular Degeneration
- Diabetic Retinopathy
- Retinitis pigmentosa

There are no nationwide reliable data on refractive errors and low vision in the country except some isolated studies.

AIMS AND OBJECTIVE

1. To study the Prevalence of low vision in patients of.
   – ARMD
   – Diabetic retinopathy
   – Myopic degeneration
   – In our setup
2. To compare and correlate the differences in acceptance of Low vision Aids in above subset of patients.
3. To assess the improvement in quality of life after LVA prescription.

MATERIAL AMD METHODS

The proposed study, which was to study the prevalence of low vision, compare and correlate the differences in

acceptance of low vision and the improvement in quality of life patients with Age Related Macular Degeneration, Diabetic Retinopathy and myopic degeneration was conducted in the "Upgraded Department of Ophthalmology, L.L.R.M Medical College, Meerut."

Patient Selection

The study period was from July 2021 to June 2022. Patients were selected from the Retina clinic. Total number of patients of each disease was 15. (Total number–45). Any patient of diabetic retinopathy, age related macular degeneration and myopic degeneration, with vision less that 6/18 in the better eye, with irreversible damage was included.

Exclusion criteria

- Glaucoma
- Patients of amblyopia
- Media opacity
- More than one of the above diseases
- Hereditary decrease in vision

History and clinical examination in the form of an evaluation form was undertaken. It included questions pertaining to age, marital status and employment to ascertain the dependency of the individual.

Educational qualifications will help to tailor the needs for LVA. It also included questions pertaining to the disease process so as to find out the duration and previous treatment options sought.

Any previous prescription of LVA, helped to compare with newer prescriptions and also to know about the cause for non-acceptance if any.

Improvement in quality of life was adjudged by a questionnaire with a set of 10 questions given once before and after the LVA prescription.

OBSERVATIONS AND RESULTS

Table 2: Results of LVA prescription.

Type of LVAs	ARMD	DM	Myopic Degeneration
Only near	8	3	2
Only distance	1	1	9
Near and Distance	2	2	3
Total	11	6	14
No device	4	9	1

Patients of ARMD benefitted most with near low vision aids, while patients of pathological myopia benefitted most from distant low vision aids.

Patients of diabetic retinopathy were worst off with up to 9 patients not benefitting from any device.

By applying Z test of proportions at confidence interval 95% for independent groups we calculate if there is any statistical difference in acceptance of different types of Low Vision Aids between two groups.

Table -3: Only Nar Low Vision AIDS.

	ARMD	DM	Myopic Degeneration
N=13	8	3	2
Observed Sample Proportion	61.5	23.0	15.38%

	ARMD	DM	Myopic Degeneration
ARMD		YES	YES
DM	YES		NO
Myopic Degeneration	YES	NO	

Near Low Vision Aids were accepted more by patients of ARMD as compared to patients of DM & Myopic Degeneration and this difference was statistically significant by applying Z test of proportions for independent groups at confidence interval of 95%.

Table-4: Only Distance Low Vision AIDS.

	ARMD	DM	Myopic Degeneration
N=11	1	1	9
Observed Sample Proportion	9.09	9.09	81.81%

	ARMD	DM	Myopic Degeneration
ARMD		NO	YES
DM	NO		YES
Myopic Degeneration	YES	YES	

Distance Low Vision Aids were accepted more by patients of Myopic Degeneration as compared to patients of DM & ARMD and this difference was statistically significant by applying Z test of proportions for independent groups at confidence interval of 95%.

Table -4: Both Near And Distance Low Vision Aids.

	ARMD	DM	Myopic Degeneration
N=7	2	2	3
Observed Sample Proportion	28.57	28.57	42.85%

	ARMD	DM	Myopic Degeneration
ARMD		NO	YES
DM	NO		NO
Myopic Degeneration	NO	NO	

By applying Z test of proportions for independent groups at confidence interval of 95%, there was no statistical difference amongst the patients of ARMD, DM and Myopic Degeneration in the acceptance of both near and distance low vision aids.

Table–5: Disease Prevalence.

Diseases	No. of patients	%
Diabetic Retinopathy	145	13.87
ARMD	69	6.60
Vascular Occlusion	34	3.25
Hypertensive Retinopathy	43	4.11
Retinal Detachment	40	3.82
Chorioretinitis	10	0.95
Retinitis Pigmentosa	30	2.80
Heredomacular Degeneration	7	0.66
Pathological Myopia	25	2.39

From the above table we can see that maximum number of patients were of Diabetic Retinopathy, followed closely by ARMD & Hypertensive Retinopathy.

This can attributed to better awareness about diabetes in the general population & also to the prevalence of diabetes in general population.

Table–6: Prevalence of Low vision.

Disease	Total No of Patients	No. of patients with Low vision	Percentage (%)
Diabetic Retinopathy	145	31	21.37
ARMD	69	20	28.98
Pathological Myopia	25	17	68.00

From the above table we can see that maximum number of patients with low vision was seen in those with diabetes, but the percentage of people with low vision is highest in patients of pathological myopia.

Improvement in Quality of Life
The improvement in quality of life was based on a vision functioning questionnaire. A minimum score of 8 and a maximum score of 65 could be achieved.

Patients of ARMD reported better scores post LVA prescription and thus we can infer that there was an improvement in quality of life.

This is to say that patients of myopic degeneration reported the most improvement in quality of life according to the visual functioning questionnaire.

DISCUSSION

Low vision refers to a significant reduction of visual function that cannot be corrected to normal range by ordinary glasses, contact lens, medical treatment or surgery. Low vision criteria only follow when the best-corrected visual acuity is less than 6/18.[1,2] Low vision aids may make things larger: they may make things brighter, they may make things clearer, and they may improve contrast.[4] Some may do more than one thing, but generally, all low vision aids make it easier to see something by magnifying it to the level one can see.

The most common cause of low vision in our study was due to Diabetic Retinopathy followed by Age Related Macular Degeneration. Similar findings were reported by APEDS.[10] where the most frequent causes of low vision included retinal diseases (35.2%), amblyopia (25.7%), optic atrophy (14.3%), glaucoma (11.2%), and corneal diseases (8.6%).

In our study most of the patients i.e. 62.22% fell into the age group of 40-60 years and least number of patients was in the age group of 0-20 Years.

Among the 45 patients included in our study 60% were male & 48.88% patients belonged to the poor socioeconomic background.

Females had a higher prevalence of low vision caused by optic atrophy whereas males had a higher prevalence of low vision caused by glaucoma adn corneal diseases.

57.77% patients in our study were illiterate. Also females formed less number of those presenting to the health care facility.

Out of the total 13 patients who were prescribed only near type of low vision aids 8 of them belonged to the ARMD group i.e. 61.5% of the patients benefitting from near low vision aids were patients were of ARMD. And this difference in acceptance of Near Low Vision Aids more by patients of ARMD as compared to patients of DM & Myopic Degeneration.

Out of the 11 patients who were prescribed only distant type of low vision aids 9 of them belonged to the group of Myopic Degeneration i.e. 81.81% of the patients who benefitted from distance low vision aids were patients of Myopic degeneration.

A total of number of 2 patients each from ARMD and diabetic Retinopathy and 3 from Myopic Degeneration were prescribed low vision aids for near and distance. But by applying Z test of proportions for independent groups at confidence interval of 95%, there was no statistical difference amongst the patients of ARMD, DM and Myopic.

The improvement in quality of life was based on a vision functioning questionnaire. A mininmum score of 8 and a maximum score of 65 could be achieved.

In patients of ARMD the mean scores pre LVA and post LVA were 25.33 and 32.47 and after applying paired *t* test (two tailed t test) and taking P value as <.05 as statistically significant. And a P value <0.01 was found and this was considered to be statistically significant.

In patients of Myopic degeneration the mean scores pre LVA and post LVA were 26.00 and 37.27 and after applying paired t test (two tailed t test) and taking P value as < 0.05 as statistically significant. And a p value <0.001 was found and this were considered to be extremely statistically significant.

In patients of DM the mean scores pre LVA and post LVA were 22.87 and 27.27 and after applying paired t test (two tailed t test) and taking p value as <.05 as statistically significant. And a p value <0.2 was found and this was considered to be not statistically significant.

Thus though patients of ARMD and Myopic Degeneration benefitted from the prescription of low vision aids, it appears that patients of Diabetes did not benefit significantly in helping to improve the quality of their life.

Findings show that low –vision rehabilitation servces significantly improve participation in daily living and QOL in people with low vision. Statistically significant improvements were also found on two of the three IVI subscales and provide further evidence of the effectiveness of the low-vision rehabilitation. However, the magnitude of the improvement was statistically and clinically modest; suggesting that further research in the current and other models of low-vision rehabilitation models is still needed to generate better rehabilitation-induced gains across the range of patients attending low-vision services.

CONCLUSION

There is a need to increase the level of awareness about low vision services for eye care professionals, other health care professionals, other health care providers and the community (parents and teachers) through mass education using web based information, media, brochures or leaflets, periodic newsletters and events organized around World Sight Day.

Low vision care is more complex than routine eye care. While many partially sighted persons can be satisfactorily treated by visual aids.

Such patients should be referred to vocational rehabilitation center. Here after initial crisis management and counseling, training is given in orientation, mobility, daily living activity, recreation and Braille reading. Community based rehabilitation programs are becoming popular now a days.

Availability of low cost good quality low vision devices is an essential prerequisite for providing low vision care.
- Constraints in delivery of low vision care.
- Lock of awareness among eye care professionals in the community.
- Non availability of good low vision training programmers.
- Very little emphasis on low vision in existing eye care programmes.
- Non availability of low cost good quality low vision devices.
- Unfavorable socio economic conditions.

Currently available devices for distance vision are telescopes which though can be utlised for reading backboard, etc.

Patients of diabetes performed worse than either patients of ARMD of myopia with trial of low vision devices.

Patients of ARMD are able to use some residual peripheral vision. Patients of myopic degeneration unless extensively involved are able to use their near vision atleast partly unaided.

All of the patients were described the uses and benefits of non optical visual aids. Attempts towards helping in rehabilitation were also made in conjunction with the department of rehabilitation.

Availability of low cast good quality of low vision devices is an essential prerequisite for providing low vision care.

BIBLIOGRAPHY

1. A Journal of Community Eye Health-17949), 2004; 1-16.
2. Wolffsohn JS. Eperjesi, The effect of relative distance enlargement on visual acuity in the visually impaired Clin exp optom, 2005 March; 88(2): 97-102.
3. http://www. ncbi. nlm.nih.gov/pmc /articles/ PMC1705713.
4. LOW vision aids-Monica Choudhary, 2006.
5. http://www.who.int/blindness/casuses/priority/en/index5.html